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The Ethnobotany of Southern Balochistan, Pakistan, with Particular Reference to Medicinal Plants

Steven M. Goodman

Abdul Ghafoor

November 30, 1992

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Back cover: Ficus racemosa

Redrawn from an original by Mr. Rafiq (Flora of Pakistan, E. Nasir and S. I. Ali, eds. No. 171: Moraceae, by Abdul Ghafoor. Karachi, 1985).

Preface

No culture in the world has escaped shaping and molding by the natural environment. People must adapt themselves to the ever-changing conditions under which they live. By the very nature of the extreme ecological conditions, human life in arid or desert regions presupposes a high degree of environmental adaptation. In such areas the resources available to local inhabitants, namely plants, water, and wild animals, are sparse or at least seasonally limited, and selective pressures for finding optimal means to exploit and manage these assets must generally be high. In many arid-zone cultures the local plants are recognized as fodder for domestic and wild animals, nutritional and vitamin supplements for people, constituents of many indigenous medicines, components in utilitarian devices, signals of seasonal change, and the underlying roots of proverbial metaphors. Given the relative simplicity of desert ecosystems, the often broad distributions of desert plant taxa, the prevalence of secondary plant compounds within these plants, and the fact that humans living in these areas are limited by the same biological controls, an intriguing question can be posed: Are there patterns of parallel plant usage among isolated desert-dwelling cultures?

Important questions in understanding the evolution of plant resource utilization are whether or not these cultures use the same basic floristic components in similar manners, and if so, whether the

similar patterns of usage for medicines, food, or utilitarian purposes reflect a shared common ancestry, are a direct result of information exchange or parallel experimentation process, or are based on chance. The critical point is that if parallel plant utilization of independent origin by culturally distinct and geographically disjunct groups could be demonstrated, this would be evidence of a similar experimentation process.

Perhaps the reason these specific questions have not been addressed in detail by ethnobotanists is that there are few natural situations in which groups that can be shown to be culturally autonomous from one another actually share the same flora. Moreover, in most such cases the diffusion of information as the underlying basis for the similarity of plant use between different cultures cannot be eliminated.

The first portion of this paper documents the use of plant resources by a desert culture inhabiting southern Pakistani Balochistan. This information will be used elsewhere in an analysis of plant resource utilization by culturally diverse and geographically isolated desert-dwelling peoples.

The second part of the paper documents the plants, therapeutic uses, and treatment methods used by herbalists and doctors living and dispensing medicines in the villages of southern Balochistan.

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Steven M. Goodman and Abdul Ghafoor

Abstract

An ethnobotanical survey was conducted between February and May 1990 in the Balochistan Province of southwestern Pakistan. This region, where a heterogeneous cultural group known as the Baloch lives, is an arid expanse of desert and mountains. Our survey focused on three specific areas: (1) the southern and central portions of Makran, (2) the Las Bella area, and (3) the central eastern portion of the province. Two distinct types of ethnobotanical information were collected: (1) plants used by nomads and village dwellers for nutritional, utilitarian, and medicinal purposes; and (2) plants prescribed and/or dispensed by herbalists or herbal doctors residing in population centers. This information is presented in two separate parts in this monograph.

Among the nomads and village dwellers, a total of 114 plant species (for four of which voucher specimens were not collected, and six of which are not native to the area) in 43 families were identified with local ethnobotanical usage; the principal emphasis was on medicinal plants. In the herbalist study, a total of 56 plant species (for two of which voucher specimens were not available, and four of which are not native to the area) in 33 families were identified. For each species, the following information is provided: Latin binomial, relevant synonyms, field collection number, locality collected, local vernacular name(s), use(s), specifics of preparation(s) or treatment(s), and miscellaneous comments. For plants presented in Part 2, the additional categories of source area and market price are also given.

General Introduction to Parts 1 and 2

From the Maghreb and Sahel of northwestern Africa across the Sahara to the Red Sea Mountains, and across the Arabian Peninsula, southern Iran, and Balochistan¹ to the Sindh and Thar desert of Pakistan and India, there is a remarkably

homogeneous zone of vegetation. A considerable number of genera and many species occur across this vast area. On the basis of a detailed analysis of plant distributions, Eig (1931–1932) referred to this area as the Saharo-Sindian phytogeographical zone. Further analysis of this pattern divided the region into two subzones, the Saharo-Arabian and the Sudano-Deccanian (Zohary, 1973; Shmida, 1985), and Balochistan shows clear affinity with the former zone (Ali & Qaiser, 1986).

Many cultures living in the Saharo-Sindian zone and relying on local plant resources for a variety of purposes have been exposed to a similar set of ecological conditions. The cultural groups living across this vast area are diverse, and herein we will present information on the use of desert plants

¹ Numerous spellings of this area have been presented in Western Romance languages. For the sake of consistency we use Balochistan, which is the official spelling according to the Government of Balochistan, Services and General Administration Department, notification No. SORI(4)6/S&GAD-89, dated 18 June 1989. Thus, the people living in this area are the Baloch and their language is Balochi.

by the Baloch living in the southern and east-central portions of Pakistani Balochistan.

The term Baloch is used for a culturally heterogeneous group of people occupying a geographically and ecologically broad zone. Greater Balochistan has been divided by modern political boundaries and includes most of the southwestern corner of Pakistan, the southern and extreme western portion of Afghanistan, southeastern Iran, and some areas of Soviet Turkmenistan (Spooner, 1975). Greater Balochistan comprises a confederation of about 500 tribes and clans (Baloch, 1985).

Our discussion will be limited to three portions of the Pakistan Province of Balochistan (fig. 1), specifically: (1) Makran—framed by the Iranian border to the west, the Hingol River to the east, the Arabian Sea to the south, and the southern slope of the Central Makran Range to the north (this delineated region is only a portion of Makran as it is usually defined); (2) the Las Bella region, specifically the area surrounding Bella (the district capital) and the Mor Range to the east and southeast of Bella; and (3) the central eastern Balochistan (= “southeast ranges” of Field [1959])—defined as the area from Wad north to Kalat, including Khuzdar, bordered to the east by the Pab Range and Harboi Hills and to the west by the eastern edge of the Garr Hills. The first two regions encompass natural ecological and cultural areas, while the third represents a botanical community that is unique to the area of Balochistan we visited but is culturally mixed. It was delineated for convenience of presenting ethnobotanical information.

The language of the Baloch is Balochi, which has a clear affinity to Farsi and belongs to the Iranian group of the Indo-European language family (Barker & Mengal, 1969). Elfenbein (1966) and Barker and Mengal (1969) recognize six more or less distinct dialects of Balochi, two of which are relevant to the present discussion: (1) the Makrani (Coastal) dialect, spoken in the southern portion of Pakistani Balochistan and west into Iran, and (2) the Rakhshani dialect, used across a broad area from and including Kalat south to Las Bella. In the eastern portion of Makran the local Makrani dialect contains a considerable amount of Sindhi, and in the northern portion of the Rakhshani area elements of Pashtu have been incorporated. The other widely spoken language of northern Pakistani Balochistan is Brahui, a derivative of a northern Dravidian language. In the Bella area the local language is Lassi, which is a dialect of Sindhi mixed with Makrani (Allana, 1979; Baloch, 1970).

Previous Ethnobotanical Studies of Balochistan

Burkill (1909) in his “A working list of the flowering plants of Balochistan” reviewed the ethnobotanical uses of a number of species but did not include any information on specific preparations, treatments, or doses. (This publication has been reprinted several times, and the pagination varies.) Within the Baluchistan District Gazetteer Series (1907) there is often a considerable amount of information on local plant uses. This information is geographically delineated using an older system of states and districts, many of which are no longer recognized or whose boundaries have since been modified (fig. 2). Hocking (1958, 1959, 1961, 1962) wrote a series of papers on the medicinal plants of Pakistan based on a three-month field survey of numerous areas of the country and included some information on Balochistan. Shinwari and Malik (1989) conducted a field study on plant utilization in the Dera Bugti area of northeastern Pakistani Balochistan and presented some preliminary results of their findings. A number of excellent ethnobotanical studies of plants collected in the wild or obtained from herbalists have been written for Iran; several of these include information from Iranian Balochistan (e.g., Hooper, 1937; Parsa, 1959a–c, 1960; Salehian et al., 1973).

Present State of Ethnobotanical Knowledge

“Herbal remedies are the world’s primary therapeutic arsenal to fight disease. It is time that botanists and anthropologists . . . acknowledge the broad scope of this medical problem [lack of data on traditional systems]. Western medicine needs to understand the botanical and cultural problems inherent in traditional medicine” (Croom, 1983, p. 23). It was estimated in the early 1950s that up to 84% of the Pakistani populace depended on traditional medicine for all or most of their medical needs (Hocking, 1958). This figure may be slightly lower now, but still a significant portion of the population, and specifically Balochistan, uses plants to meet its health needs. In recent years there has been a significant increase in the general importance and availability of Western-style allopathic medicines, generally in the larger population centers. For the most part, these medicines are relatively expensive compared to traditional

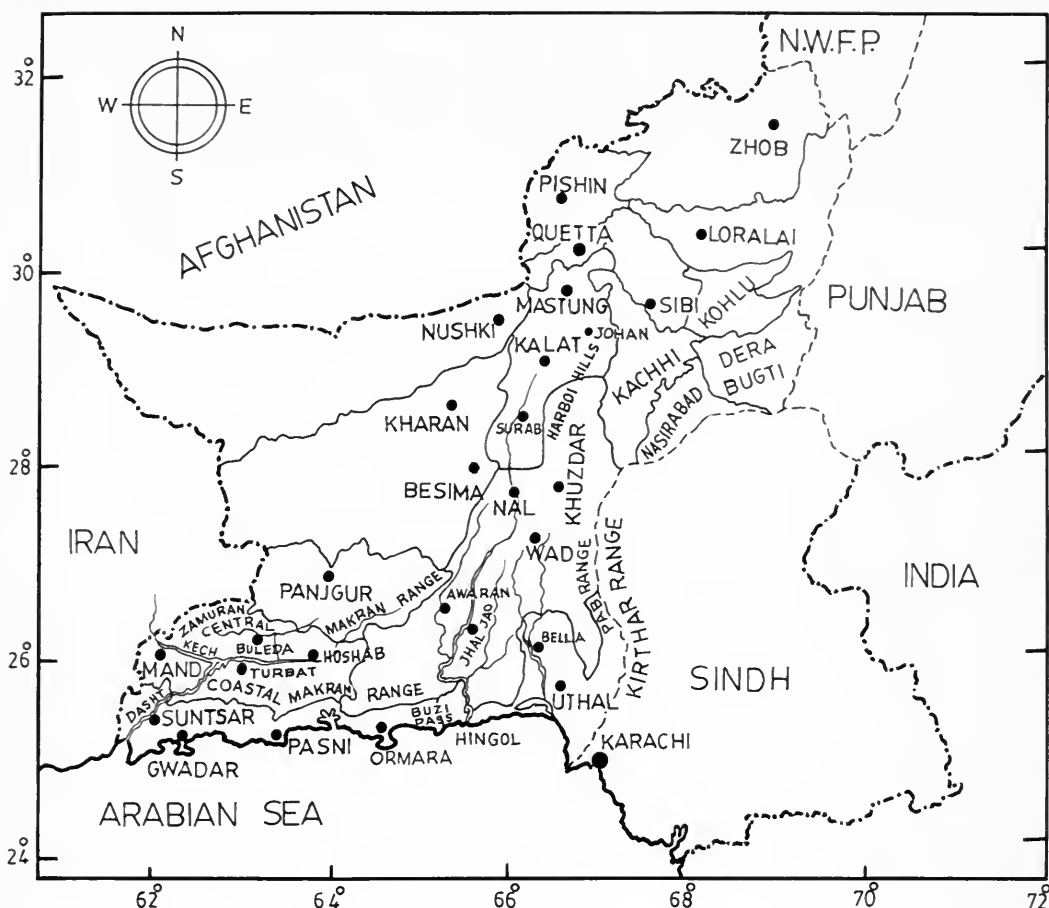


FIG. 1. Map of Balochistan Province and neighboring areas. Other Pakistani provinces surrounding Balochistan include North West Frontier Province (N.W.F.P.), Punjab Province, and Sindh Province.

herbal medicine, and for people living in remote areas they are generally inaccessible.

In 1951 the Pakistan Ministry of Food and Agriculture, with the sponsorship of the Expanded Technical Aid Program of the Food and Agriculture Organization, commenced a survey of the national ethnobotanical resources under the project name, "Botanical Survey of Medicinal Plants." The main purpose of this work was to carry out an inventory of the indigenous medicinal plants and herbs of the country (Hocking, 1958, 1959, 1961, 1962; Zaman, 1961; Kazmi, 1966). This program revitalized research interest in national ethnobotanical resources. As the project progressed, the focus shifted from comprehensive regional surveys to chemical analysis, isolation, and quantitative estimation of the principal compounds in species of plants with attributed ther-

apeutic qualities (Baquar & Tasnif, 1967; Zaman & Khan, 1970; Ikram & Hussain, 1978; Khan et al., 1979). A number of Pakistani scientists continue to have active field research programs in gathering ethnobotanical information (e.g., Usmanhane et al., 1986; Shinwari & Malik, 1989).

In the past decade or so, the southern region of Balochistan has been the site of a massive development scheme, largely financed by foreign aid missions (Harrison, 1981). These programs have financed the construction of hard-packed roads into areas that were formerly isolated and the establishment of schools where Urdu (the national tongue of Pakistan) is taught as the primary language and Balochi as a secondary language. These programs have also provided the infrastructure for the immigration of other cultural groups into Balochistan and have resulted in a significant change

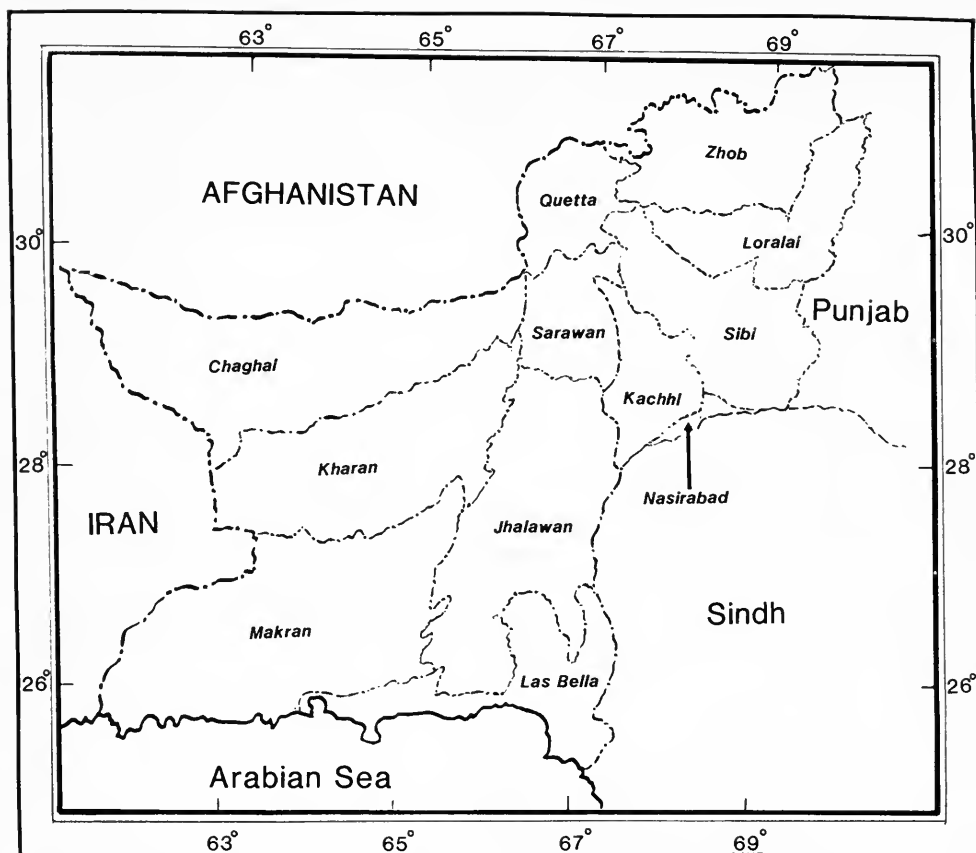


FIG. 2. States and districts forming in April 1952 the Balochistan States Union (based on Field, 1959). A comparison with modern divisions (fig. 3) shows changes in the political and tribal boundaries within Pakistani Balochistan.

from a more-or-less self-sufficient economy to one moving toward an import economy.

The traditional ways of Balochistan are quickly changing. We have no pretense that the present report reflects the complete pharmacopoeia of southern Balochistan. However, we are certain that the current ethnobotanical knowledge of the Baloch is a vestige of a long cultural tradition. The reality is that even less of it will be known one generation from now.

The Settings

Makran

The modern Makran Division of Pakistan is a region of 54,646 km². It is for the most part an arid expanse of desert and mountains that is

sparsely inhabited by people; the 1981 population was estimated to be 652,602 and the density 11.9 persons/km² (Population Census Organization, 1984). The Makran Division now comprises the districts of Gwadar, Panjgur, and Turbat (fig. 3).

For hundreds of years, an important trade route passing through the Makran region linked the Persians to the west and numerous Indian subcontinent groups to the east, giving the area a complex cultural history. Added to this have been numerous conquests and intrusions or invasions by other groups, including Macedonian, Arab, Marco Polo, Brahui Khans, British, and modern Pakistani (Pastner, 1971; Baluch, 1984). Until 1958, Gwadar and its immediate environs were under the control of the Sheikh of Muscat, Oman (Kessing's Contemporary Archives, 1958; Field, 1959). The area of Makran where we worked can be topographically divided into two distinct features: the narrow coastal strip bordering the Arabian Sea,

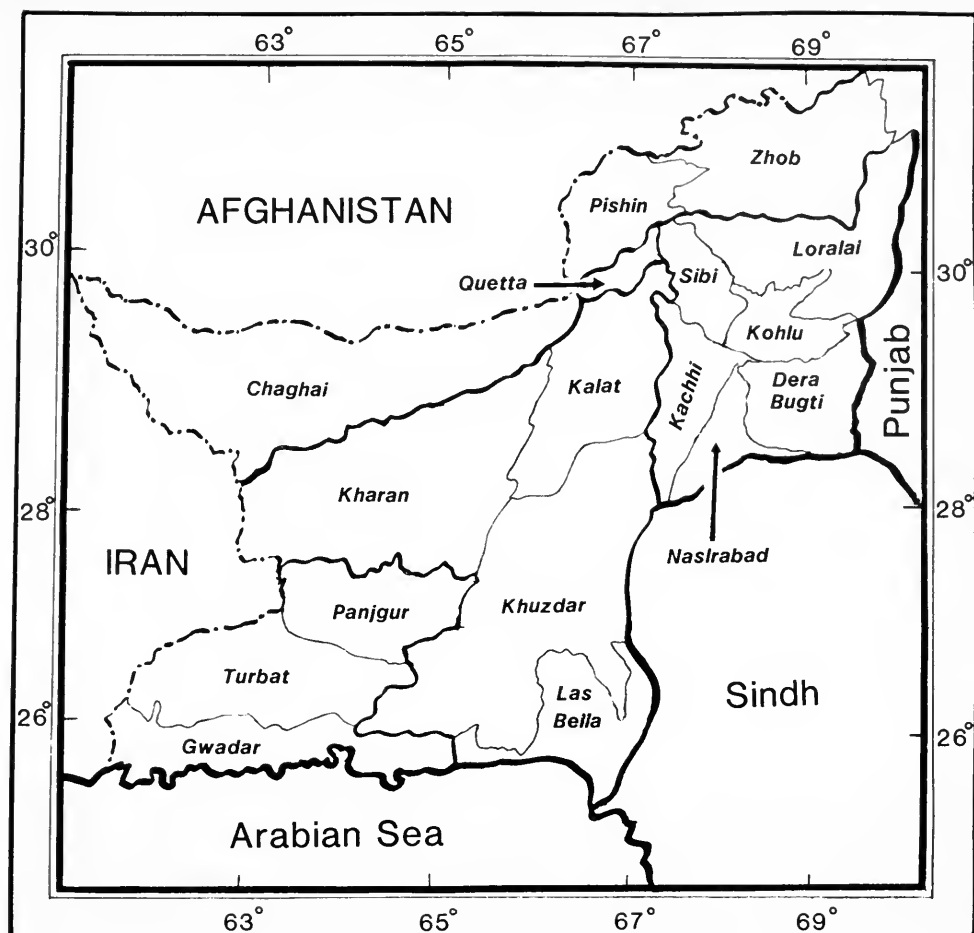


FIG. 3. Modern divisions and districts of Balochistan Province.

and the inland ranges with their deeply cut and often narrow gorges.

The coastal strip is relatively narrow, varying from 10 km to 35 km in width, and from which the southern slope of the Coastal Makran Range abruptly rises. The climate is characterized by a short period of winter rains, generally falling from November to February. Between 1931 and 1960, the average maximum monthly rainfall at Pasni never exceeded 45 mm, and the total mean annual precipitation was less than 132 mm. Temperatures varied from a mean daily maximum temperature of about 19.3° C during the coldest month (January) to a mean daily maximum of almost 40° C during the summer months (Ahmad, 1987).

The vegetation of this zone can be divided into several distinct communities (Ahmad, 1987; Snead & Tasnif, 1966; Tasnif & Snead, 1964). The tidal coastal area includes a series of lagoons dominated

by mangrove (*Avicennia alba*, *Ceriops tagal*, and *Rhizophora mucronata*). Due to the regular inundation of these lagoons and coastal marshes by seawater, the soils contain a high concentration of salts. When present, the plants characteristic of these areas are halophytic and include a variety of *Chenopodiaceae* and *Tamarix* spp. The higher ground above the tide inundation line generally bears a shifting sand dune community typified by the plants *Calotropis procera*, *Citrullus colocynthis*, *Cornulaca monacantha*, and *Heliotropium subulatum*. On the more stable inland dunes and coastal desert plains, *Aerva persica*, *Acacia* spp., and *Sericostoma pauciflorum* are common members of the local community. Farther inland, on the often barren slopes of the Coastal Makran Range, there is a pronounced change in the floristic composition. Here the dominant plants are *Caparis spinosa*, *Reseda aucheri*, and *Inula gran-*

tioides. In the sandy valley bottoms and dry stream beds *Acacia* spp., *Capparis decidua*, *Cymbopogon jawarancusa*, *Nerium oleander*, *Panicum turgidum*, and *Nannorhops ritchiana* are characteristic. There is also a greater variety of woody plants and small herbs, and, after rains, ephemeral flowering species.

Between the Coastal Makran Range and the Central Makran Range is the broad river valley of Kech, which near Turbat (500 m) is about 2.5 km wide with shallow banks approximately 2 m high. Just to the west of Turbat, the Kech merges with the Nihing to form the Dasht, which drains into the Arabian Sea just east of the Iranian border. These water catchments, and the numerous small streams that feed into them, are dry throughout much of the year, except after the winter rains. However, associated with these basins is subterranean water, which nurtures some productive agricultural lands, date palm groves, and relatively lush growths of natural vegetation. Such areas tend to be clustered around the major inland population centers of Makran, such as Turbat, Hoshab, and Mand. An elaborate system of underground channels, known as *kārēz*, transverse considerable distances and act as water conduits from the mountain catchments to cultivated lowland areas. There is also a relatively high concentration of people living along the coast in or near the villages of Gwadar, Pasni, Ormara, etc., and working in the fisheries or service sector. Scattered throughout the hills of Makran are two different styles of nomadic people: (1) pastoralists moving their domestic herds in search of water and fodder, and (2) people whose peregrinations are not for pasture resources, but rather as hired labor for agricultural opportunities and raiding. The latter group may reside for a portion of the year in villages with truly sedentary Baloch (Pastner, 1971).

Las Bella

An area of approximately 16,800 km², Las Bella is largely composed of a triangular-shaped alluvial basin, 80 km east to west at the southern end and 130 km from north to south. The southern edge of this triangle is the Arabian Sea coast. The major human settlement of the area is at Bella. In the modern sense Las Bella is a district within the Kalat Division (fig. 3). As of 1981 it comprised an area of 12,574 km² and a population of 188,139, giving a density of 15.0 persons/km² (Population Census Organization, 1984).

Historically, Las Bella (Arma Bel) was part of Sindh and ruled by the Rai family from 492 to 642 A.D. The Rai Kingdom spread all over coastal Balochistan (Las Bella and Makran) up to Kerman in modern Iran. In the seventh century Las Bella was under Buddhist control. After the Arab conquests of the area in the early eighteenth century, Buddhism was replaced by Islam, although the region remained in close contact with Sindhi Hindus to the immediate east. Many tribes from Sindh settled in the Las Bella area, and the interaction of these people with local tribes resulted in the Lassi dialect of the Sindhi language. Lassi is rather similar to the Larr dialect of Lower Sindh (Allana, 1979; Baloch, 1970) and is also spoken in Ormara, Pasni, Jiwani, Gwadar, and the coastal areas of Iranian Makran. Bella and the surrounding environs remain a blend of various cultural heritages (Baluch, 1984; Baluchistan District Gazetteer Series, 1907, vol. VII).

The Las Bella basin is surrounded on the east and west by the Mor and Hala mountains, respectively, the latter being an extremely rugged and heavily eroded range (fig. 4). After occasional heavy rain, ephemeral rivers bring down sediments from these ranges which are deposited in the valley. The area is characterized by monsoon summer rains, falling between June and August, and, compared to Makran, it has a less pronounced winter rain season. Between 1931 and 1960 at Sonmiani, on the Arabian Sea coast, the average maximum rainfall never exceeded 45 mm, and the total mean annual precipitation was less than 120 mm. Temperatures varied from a mean daily maximum temperature of about 17.2° C during the coldest month (January) to a mean daily maximum temperature of 31° C during the summer months (Ahmad, 1987). However, farther inland, near Bella, the summers are exceedingly hot: the mean maximum June temperature over a ten-year period was 34° C, with daily highs reaching 48° C (Snead & Tasnif, 1966).

The vegetation of the Bella region resembles coastal Makran's in many ways. The coastal tidal zone is similar, the major difference being that along the Las Bella coast *Arthrocnemum indicum* is a common element. The coastal sand dune communities show clear parallels, although one important addition is the presence of *Ipomoea pes-caprae* in the Las Bella area. The major difference between the dry streambed plants of these two areas is that calcareous soils are present in the Las Bella region; such places are characterized by *Euphorbia caducifolia*, *Leptadenia pyrotechnica*, *Pro-*



FIG. 4. The Hala Mountains west of Bella, just above the Las Bella basin. Note the heavily eroded slopes and the almost complete lack of vegetation. The main road leading to Makran passes through this mountain range. (Photo taken 15 May 1990 by S. M. Goodman.)

sopis cineraria, and *Tamarix aphylla*. *Prosopis juliflora* and *P. glandulosa*, two introduced trees, have colonized vast portions of this area and are used to stabilize sand dunes (Ahmad, 1987). On the mountain slopes and in rocky areas with calcareous soils, a different set of species grows, e.g., *Taverniera lappacea*, *Pulicaria hookeri*, *Glossonema varians*, and *Commiphora* spp. (Ahmad, 1987; Snead & Tasnif, 1966). In the low-lying areas of the Las Bella basin are some arable lands on which a number of cereal and vegetable crops are grown, as well as date palm and fruit orchards (fig. 5). Groups of pastoral nomads live in the outlying areas, and their domestic animal herds feed on the scanty scrub vegetation (Snead & Tasnif, 1966).

Central Eastern Balochistan

The total land area, population, and density of people (as of 1981) within the northern portion of

the Khuzdar Division are, respectively: Kalat District, 12,517 km², 341,193 individuals, and 27.3 persons/km²; and Khuzdar District, 64,891 km², 386,802 individuals, and 6.0 persons/km² (Population Census Organization, 1984).

The climate of this region is different from that of areas farther south, mostly owing to the higher elevation, which results in cooler temperatures. At Kalat (2060 m altitude), the major period of rain is between December and February, and the summer rains associated with the Indian Ocean monsoon are minimal. Field (1959) presented some summary weather information for Kalat from an unspecified period of time. The average maximum monthly rainfall was in February and never exceeded 35 mm, and the total mean annual precipitation was less than 171 mm. At this locality, temperatures varied from a mean daily maximum of about 10° C during the coldest month (January) to a mean daily maximum of 32° C during the hottest month (July).

The vegetation in the Kalat and Harboi Hills



FIG. 5. Agricultural area in Las Bella basin to the northeast of Bella. Area in foreground is a *Ricinus communis* plantation. Trees in background area are mostly *Acacia nilotica*. (Photo taken 24 March 1990 by S. M. Goodman.)

(rising to about 2700 m altitude) is distinctly different from areas of Las Bella and Makran. The upper mountain slopes have scattered groves of *Juniperus excelsa*, *Pistacia khinjuk*, and *Olea ferruginea*, while valleys and water catchments have a relatively wide variety of vegetation (fig. 6). When we visited Johan (1400 m altitude) during mid-May 1990, the Sarawan River, which drains the northern portion of the Harboi Hills, was filled with water and the bordering areas had relatively lush growths of plants (fig. 7). The lower slopes have areas of herbaceous plants, particularly in the spring, that are characterized by various species of *Consolida*, *Adonis*, *Astragalus*, *Lallemantia*, *Sisymbrium*, *Alyssum*, *Heliotropium*, and *Euphorbia*. The most notable forage grasses in the area include species of *Bromus*, *Phalaris*, *Cymbopogon*, and *Boissiera squarrosa*. The bulbous, tuberous, and rhizomatous plants include species of *Allium*, *Tulipa*, *Dispcadi*, *Muscari*, *Asparagus*, *Gagea*, *Scorzonera*, and *Juncus*. In the lower valleys or basins with alluvial soils, there are often

dense growths of herbaceous vegetation, most notably *Artemisia* spp.; other characteristic plants include *Nannorhops ritchiana*, *Acacia* spp., *Caparis decidua*, and *Calotropis procera*. Near Khuzdar (1230 m altitude) and farther south toward Wad (800 m altitude), the distinctive mountain species and the *Artemisia* steppe characteristic of higher elevations drop out, and the local floral community is similar to what is found in the Las Bella and Makran areas. In the alluvial basins just south of Wad, *Tecomella undulata*, an introduced plant, is often a dominant aspect of the flora.

Explanation of General Format

Vernacular Names

Under each taxon we have included the heading, "Vernacular Name." These are the names used by the informant. Because the linguistic picture of the

region is complex, we have tried to indicate which language the name is from. The languages represented include:

- A = Arabic, generally classical
- B = general Balochi
- Br = Brahui, the form used in the vicinity of Kalat and Khuzdar
- F = Farsi
- L = Lassi, a mixed Makrani/Sindhi dialect spoken in the Las Bella area
- S = Sindhi
- U = Urdu

In any case, when the language or dialect of a vernacular name or descriptive term has not been identified, it should be assumed to be from the Balochi.

All of these languages use a standard or modified Arabic script in their written form. The system used to transliterate consonants is based on Gibb et al. (1960); however, we have deviated from this system for short and long vowels by transliterating them as follows:

<u>long sounds</u>	<u>short sounds</u>
ā = aa	ă
ē	ĕ
ī	ĭ
ō	ŏ
ū = oo	ŭ

Measurements and Units

In the Treatment and Procedure sections of the systematic lists, the type of vessel noted by our informant for liquid measurements is given, rather than the actual volume itself. The following equivalents should be used when making conversions:

- cup = 200–250 ml
- glass = 300–350 ml
- bucket = 15–20 L

All weights mentioned in the text are estimates provided by our informants.

Localities

The latitude and longitude of places mentioned in the text are listed in Appendix 1, and many are

plotted on Figure 1. We have generally followed the spellings used in the first edition of the Survey of Pakistan, 1:500,000 series, published by the Surveyor General of Pakistan, Rawalpindi. All elevations are meters above sea level.

Order, Nomenclature, and Systematic Lists

We have adopted the nomenclature and followed the systematic sequence and synonymies used by Stewart (1972). The only exceptions are names used in the more recent systematic treatments and reviews presented in the *Flora of Pakistan* series, edited by Drs. E. Nasir and S. I. Ali. (This series was called *Flora of West Pakistan* until 1980, no. 132.) Synonyms have also been included for those names mentioned in the ethnobotanical literature of Balochistan and surrounding areas.

In numerous cases, our ethnobotanical information for a single species of plant comes from several sources. Because of differences between local languages, cultural groups, or local uses for the plant, we have generally not combined this information into a single species narration. For example, we have two samples of *Cymbopogon jawarancusa* with ethnobotanical data, one from the Pasni area and another from near Zeedi, and these two samples are presented as separate entries under the same species name (see pp. 17–18).

Medical Terminology, Disease Diagnosis, and Treatment Procedures

It is often difficult or impossible to ascribe a Western medical term to an ailment or disease described by an informant. This is not simply a lack of language synonyms but, perhaps more important, reflects cultural differences in the concepts of the underlying causes of disease and forms of treatment (Fabrega, 1975; Lieban, 1977). One presumption on our part in the presentation of this information is that there are inherent therapeutic qualities in these plants, but that it is not our task to evaluate them in this paper. We report data given to us by our informants; the utility and healing qualities of various remedies and treatments are described from their perspective. To a great extent, what is presented in the systematic lists is a concise and explicit translation of what our informants discussed with us. We have tried to present this information without an overlay of external cultural screening or prejudice. Thus, terms



FIG. 6. Jergi Gorge Pass at about 2150 m on track leading from Kalat to Nichara. A relatively diverse flora was found in the shaded areas of such canyons; for example, woody plants included *Ephedra*, *Pistacia*, and *Olea*. (Photo taken 12 May 1990 by S. M. Goodman.)

such as “claimed to,” “reputed to,” or “said to” are generally avoided. Healing can have many facets, including physical, psychological, and spiritual; at some level, it is irrelevant whether these aspects can or cannot be explained by Western medical practices or dogma.

For example, many Baloch believe that toothache and cavities are caused by, respectively, worms in the gums or worms actually burrowing into the teeth. Although no one with whom we discussed such a disorder had actually seen these worms, they were convinced that there was a direct cause-and-effect relationship between the presence

of these animals and gum or tooth disease. Another example is the use of coolants. Unani medicine prescribes that in order to treat diseases and ailments that cause internal heat, such as infection or fever, one uses a cooling agent. These coolants literally draw heat out of the body and thus bring relief to the patient.

A common belief is that malaria and jaundice are related disorders affecting the liver, and that both diseases are transmitted to humans by mosquitoes. It is thought that jaundice is a direct consequence of malaria. If the malarial fever is not controlled, the parasite infestation and subsequent



FIG. 7. The Sarawan River basin to the west of Johan at approximately 1600 m altitude. The river passes at the base of the small cliffs just behind the buildings. Note the arable land, relatively dense vegetation, and camel (for scale) in the center foreground. (Photo taken 13 May 1990 by S. M. Goodman.)

destruction of red blood cells effectively results in liver damage and yellowing of the skin. When this skin coloration persists after successful treatment of malaria, it is assumed to be the result of jaundice, and further treatment continues.

Given these different perspectives and the difficulty in many cases of using Western medical terminology to describe various ailments, we have often used the Balochi word in transliterated form alongside our English interpretation of its meaning. We have generally followed Boulos (1983) for Western medical terminology.

Part 1. Ethnobotanical Uses of Wild Plants

Methodology

FIELD COLLECTION PROCEDURE—Our general method of obtaining information was to travel to

a village and try to meet local governmental officials, tribal leaders, and market herbalists, from whom we inquired about local people familiar with the use of wild plants for ethnobotanical purposes. After receiving suggestions we would search for these potential informants and, when we found them, explain the purpose of our survey and at the same time try to determine the extent of their ethnobotanical knowledge, their cultural origins, and their history, particularly with regard to travel. In several areas we were required by the provincial authorities to be accompanied by members of the local levy force, who often had an extensive ethnobotanical knowledge (fig. 8). We focused more on plants used primarily for medicinal purposes rather than on those used primarily for utilitarian or nutritional purposes. Because the sexes are strictly segregated in Baloch culture, and because both of us are male, we were not able to interview women. Thus, a significant portion of the total cultural use of plants is not represented in this report. Several male contacts were well versed on

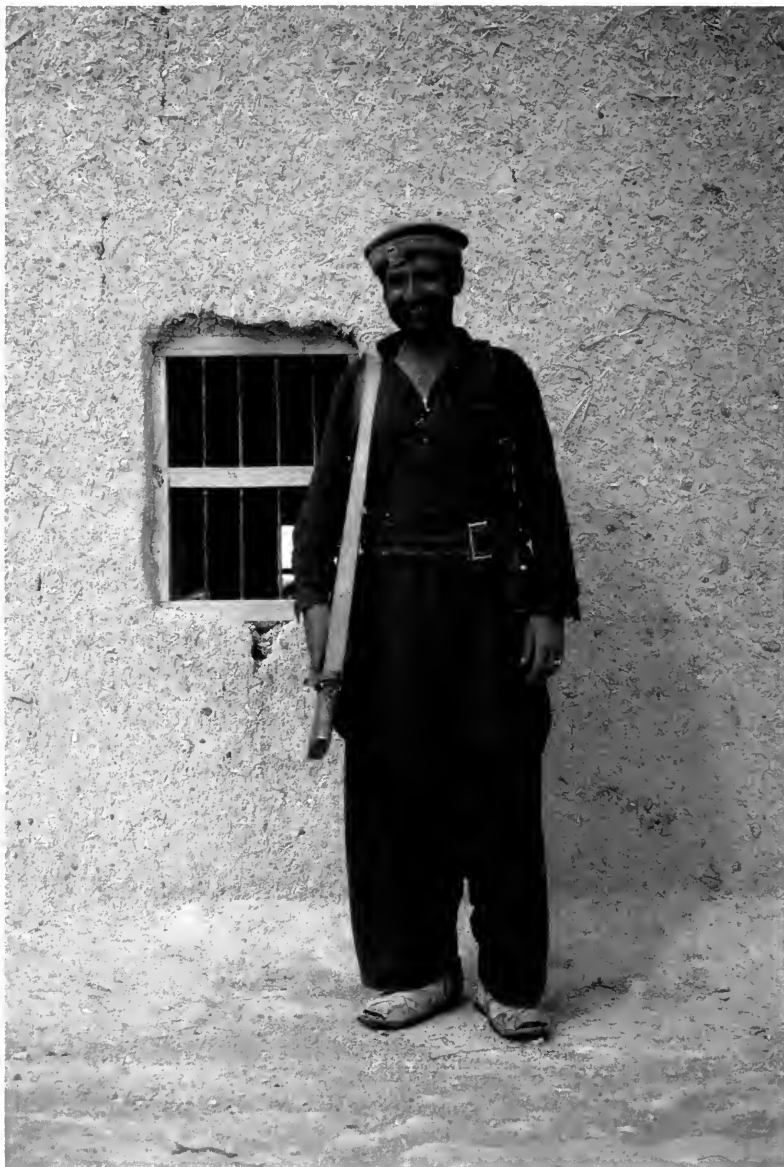


FIG. 8. Haggi Abdul Karim stationed at levy post 16 km west of Kunj, between Khuzdar and Nal. He discussed and shared with us his extensive knowledge of the ethnobotanical uses of local plants.

plants used for a variety of female ailments and shared this information with us. In one case, a contact relayed information he solicited on our behalf from a female midwife.

Throughout our travels in Balochistan we made a general collection of plants. Our contacts were often with us during these collecting forays, and they would generally point out important ethnobotanical plants, voucher specimens of which would be taken. A few hours later, while we were

pressing the material, they would describe to us in detail the plants' uses. In some cases our informant took us to a specific area known to have important plants. In other cases we traveled on our own and spontaneously interviewed people we met along the way (fig. 9). Whenever possible we collected multiple specimens of each plant; these were then catalogued with AG & SMG (Abdul Ghafoor & Steven M. Goodman) field numbers during the pressing process. The voucher speci-



FIG. 9. Abdul Ghafoor (center) with a Baloch man and woman near Jhal Jao. The couple passed us in the desert as we were collecting plants. A spontaneous interview ensued. The plant in the foreground is *Tephrosia apollinea*. The straps of the man's sandals are made from *Nannorrhops*, as is the collar and rope restraining the goat. The woman was spinning wool as they walked. (Photo taken 23 March 1990 by S. M. Goodman.)

mens were subsequently split into two sets, with the first set deposited in the Karachi University Herbarium (KUH), University of Karachi, and the second set deposited in the Department of Botany, Field Museum of Natural History (F). In a few cases voucher specimens were not collected, but, based on the second author's extensive knowledge of the local flora, we feel confident with the iden-

tifications, and this information is presented in the systematic lists.

Before departing for the field, we composed a list of questions associated with each ethnobotanical specimen, largely modeled after Croom (1983) and Lipp (1989), and as far as possible this procedure was followed. These points included: (1) specific questions on the local vernacular name(s)

of the plant, parts, or by-products derived from it, (2) ethnobotanical uses, and (3) methods of treatment, including preparation, quantity, dosage, frequency, and differences in age or sex of the patient.

Systematic List

EPHEDRACEAE

Ephedra intermedia Schrenk & Mey. (Icon.: Nasir & Nasir, Fl. Pak. 186: 31, fig. 6F-1, 1987).

VOUCHER SPECIMEN—AG & SMG 5153.

LOCALITY—Between Nichara and Kalat.

VERNACULAR NAME—*nārōm*.

USE—To tan animal hides for water sacks (*māshk*, *khāwā*) and butter-churning containers.

PROCEDURE—Several kilograms of aerial parts are crushed and boiled in a vat with at least 10 L of water. The resulting decoction is strained and stored. For water sacks, only goat skins are used. After the animal is skinned, the hide is filled with the decoction and not inverted. After two or three days the hair falls out and the tanning liquid should be replaced with fresh solution. After four more days all the liquid is poured off and the skin is ready for use.

Sheep skins are used as butter-churning containers, and they need special preparation. The freshly skinned hide is wrapped tightly in cloth to keep air out. After about two days the skin starts to smell, and the bundle is then unwrapped and the hair is easily plucked off. The skin is then submerged in the tanning liquid for two to four days, after which the liquid is replaced with fresh solution and reimmersed for two to four more days. After this period the liquid is poured off and the skin is partially filled with milk, shaken vigorously, and the contents discarded. Then a small amount of fresh milk is added to the skin, shaken until butter forms, and the contents poured off. The skin is then passed over the smoke of burning *Astragalus strobiliferus* (AG & SMG 5149) for two or three hours, which helps remove the taste of the tanning solution. The skin is then ready for use.

COMMENTS—Blatter et al. (1920, p. 352) noted that this plant is used in Balochistan to tan animal hides. In the Baluchistan District Gazetteer Series (1907, vol. VI-B, pp. 240–241) it is mentioned that in the Jhalawan area the twigs of *E. pachy-*

clada are used to tan skins for use as water sacks. This species is rare in Balochistan and may well have been confused with *E. procera* or *E. intermedia*. In Balochistan all *Ephedra* spp. are called *nārōm*.

CUPRESSACEAE

Juniperus excelsa M. Bieb. (Icon.: Nasir & Nasir, Fl. Pak. 184: 20, fig. 4C–D, 1987).

syns.: *Juniperus polycarpus* C. Koch; *Juniperus macrospoda* Boiss.

VOUCHER SPECIMEN—AG & SMG 5137.

LOCALITY—Between Nichara and Kalat.

VERNACULAR NAME—*āpūrsk*.

USE—To relieve fever of all sorts.

TREATMENT—One to three ripe fruits are taken orally to relieve headache and fever. Locally the fruits are referred to as natural aspirin and are taken whenever needed. These fruits are also an important component in numerous Unani composite medicines (fig. 10).

COMMENTS—The fruits have been reported by Blatter et al. (1920, p. 352) to be used to relieve chest diseases.

TYPHACEAE

Typha domingensis Pers. (Icon.: Omer & Hashmi, Fl. Pak. 177: 5, fig. 2F–H, 1987).

syns.: *Typha angustata* Bory & Chaub.; *T. angustifolia* non L.: *sensu* Burkill.

VOUCHER SPECIMEN—Not collected.

LOCALITY—Zeedi.

VERNACULAR NAME—*kūl*.

USES—The tender shoots are an important fodder for domestic animals, particularly cattle, while the leaves are used in house construction as roofing material and for a wide variety of utilitarian purposes (fig. 11).

COMMENTS—Blatter et al. (1920, p. 347) noted that the ripe heads of flowering stalks are used to stuff cushions and pillows. The Baluchistan District Gazetteer Series (1907, vol. VI-B, pp. 240–241) mentions that in the Jhalawan area the leaves are used for roof thatch.



FIG. 10. Approximately 28 km southeast of Kalat, at about 1525 m elevation, on track leading to Nichara. *Juniperus excelsa* is in the foreground. An extensive plain can be seen below. Note truck on center right along track for scale. (Photo taken 12 May 1990 by S. M. Goodman.)

PALMAE

Nannorhops ritchiana (Griff.) Aitchison (Icon.: Malik, Fl. Pak. 153: 18, fig. 5, 1984).

syn.: *Chamaerops ritchiana* Griff.

VOUCHER SPECIMEN—AG & SMG 4419.
 LOCALITY—Awaran area.
 VERNACULAR NAME—*pēesh*.

USES—The inner portion of the young inflorescences are eaten raw or steamed as food. The leaves and stems are employed in the construction of mats, fences, and house roofing (fig. 12). Fiber extracted from the leaves is used to make ropes, cots, and sandals (*sāwās*).

COMMENTS—Burkill (1909, p. 75) mentioned that in several places in Balochistan this plant, generally frond fiber, is used to make mats, ropes, and sandals. Field (1959, p. 35) noted that in addition to the various utilitarian uses of this plant, the delicate young leaves are used to treat dys-

entery and diarrhea. In the Baluchistan District Gazetteer Series (1907, vol. VII, p. 218) the uses of this plant in the Makran area are reviewed.

LILIACEAE

Asphodelus tenuifolius Cavan (Icon.: Wendelbo, Fl. Iran. 151: 4, tab. 1, 1982).

VOUCHER SPECIMEN—AG & SMG 4578.
 LOCALITY—Turbat area.
 VERNACULAR NAME—*pīmālūk*.

USE—The leaves are eaten raw as a vegetable.

Tulipa lehmanniana Merckl. (Icon.: Rechinger, Fl. Iran. 165: 101, tab. 85, 1990).

syn.: *Tulipa montana* Boiss.

VOUCHER SPECIMEN—AG & SMG 5128.



FIG. 11. Date palm grove near village of Zeedi, about 30 km east of Khuzdar. The reed beds are composed mostly of *Typha domingensis*, which is heavily grazed by cows. *Typha* leaves are an important roofing material for buildings in Zeedi. (Photo taken 8 May 1990 by S. M. Goodman.)

LOCALITY—Kalat area.

VERNACULAR NAME—*ghāwārch*.

USE—The tubers of this plant are often eaten raw as food; they are also dried and stored for later consumption.

COMMENTS—Burkill (1909, p. 74) reported that in the Kalat area the bulbs are eaten by people and the leaves are used as fodder for goats.

ALLIACEAE

Allium umbilicatum Boiss. (Icon.: Nasir, Fl. W. Pak. 83: 18, fig. 7D–G, 1975).

VOUCHER SPECIMEN—AG & SMG 5180.

LOCALITY—Kalat area.

VERNACULAR NAME—*pīmālākō*.

USE—The leaves are chopped into small pieces and added to *pārātha* (thin fried bread) flour for

consumption. It is also used as a general condiment.

IRIDACEAE

Iris falcifolia Bunge (Icon.: Wendelbo & Mathew, Fl. Iran. 112: 37, tab. 7, fig. 13, 1975).

VOUCHER SPECIMEN—AG & SMG 4967.

LOCALITY—Zeedi area.

VERNACULAR NAME—*khākhōbē*.

USE—As a purgative.

TREATMENT—Consumption of a small piece of root tuber by humans or domestic animals causes diarrhea, although the plant is seldom used for this purpose.

COMMENTS—A *pansari* (herbalist) in Khuzdar mentioned to us that the oil obtained from the tubers of this plant is used as an ointment to treat rheumatism.



FIG. 12. *Nannorhops ritichiana* growing 15 km south of Turbat on road to Gwadar. Note the flowering stalks. (Photo taken 15 March 1990 by S. M. Goodman.)

GRAMINEAE

Cymbopogon jawarancusa (Jones) Schult. (Icon.: Jafri, Fl. Kar. 37, fig. 37, 1966).

syn.: *Andropogon jawarancusa* Jones.

VOUCHER SPECIMEN—AG & SMG 4823.

LOCALITY—Pasni area.

VERNACULAR NAME—*nādāg*.

USE—The upper half of the aerial portions is chopped and is used as an additive to tea. It is also used alone as a caffeine-free green tea.

COMMENTS—Burkill (1909, p. 117) obtained information in the Turbat area about a plant, locally called *nādāg*, that he tentatively identified as this species. He noted that it was put under the bodies of dead people during burial to help prevent early

decay, and that pastoralists washed the pens of domestic animals with the leaves to make the milk fragrant. Blatter et al. (1920, p. 349) remarked that this plant is used in Balochistan to treat fever. A quantity of the herb is collected and made into a cushion; the patient then lies on it and immediately breaks out into a heavy sweat that dissipates the fever.

VOUCHER SPECIMEN—AG & SMG 4977.

LOCALITY—Zeedi area.

VERNACULAR NAME—*hāvāī*.

USE—To relieve nasal and throat congestion caused by the common cold.

TREATMENT—About 250 g of plant parts are boiled in two glasses of water and the patient inhales the vapors. Simultaneously, about ½ cup of the decoction is drunk. This procedure is followed once or twice per day for two or three days.

SALICACEAE

Populus euphratica Oliv. (Icon.: Meikle, Fl. Iraq 4(1): 27, pl. 6, 1980).

VOUCHER SPECIMEN—AG & SMG 4870.

LOCALITY—Bella area.

VERNACULAR NAME—*pātāk* (L).

USE—To relieve joint pain caused by lack of activity (*bādi*) rather than by overexertion.

TREATMENT—About 50 g of dried or fresh leaves are soaked in a glass of water overnight. In the morning the extract is strained and drunk. Used whenever needed.

COMMENTS—In the Mashkai area the wood is an important fuel, and charcoal prepared from it is used in the manufacture of gunpowder (Baluchistan District Gazetteer Series, 1907, vol. VI-B, pp. 242–243).

Salix acmophylla Boiss. (Icon.: Zohary, Fl. Palestinaest. 1: 26, pl. 24, 1966).

VOUCHER SPECIMEN—AG & SMG 4970.

LOCALITY—Zeedi area.

VERNACULAR NAME—*gāīt*.

USE—To relieve symptoms of jaundice (*kāwāl*).

TREATMENT—About 125 g of leaves and tender stems are crushed and placed in one glass of water overnight. In the morning the extract is strained and drunk before breakfast. This dose is taken each day for three days. If symptoms persist, the

treatment is repeated for three more days. This medicine should not be taken for more than seven days in a row.

COMMENTS—Used by Khuzdar carpet weavers as a dye (Burkill, 1909, p. 71).

MORACEAE

Ficus johannis Boiss. (Icon.: Ghafoor, Fl. Pak. 171: 21, fig. 3, 1985).

syn.: *Ficus carica* non L.: *sensu* Burkill *pro parte*.

VOUCHER SPECIMEN—AG & SMG 4589.

LOCALITY—Turbat area.

VERNACULAR NAME—Not recorded.

USE—The ripe purple fruits are eaten as food. They can be consumed immediately after they are picked from the tree because there is no need to let the latex drain out.

COMMENTS—Burkill (1909, p. 70) noted that the ripe fruits were eaten by people. He also presented numerous vernacular names for this plant from various areas of Balochistan.

POLYGONACEAE

Polygonum argyrocoleon Steud. & Kuntze (Icon.: Komarov, Fl. URSS 5: 634, tab. 44, fig. 1, 1936).

VOUCHER SPECIMEN—AG & SMG 5176.

LOCALITY—Kalat area.

VERNACULAR NAME—*sōērīs*.

USE—Important camel fodder. The aerial portions of this plant are regularly gathered in remote areas and transported to villages to feed domestic animals.

Polygonum plebejum R. Br.

VOUCHER SPECIMEN—AG & SMG 4454.

LOCALITY—Awaran area.

VERNACULAR NAME—*gūl sūrh*.

USE—To relieve constipation and associated stomach pain.

TREATMENT—Fresh portions of the green plant are crushed and pressed, and the juice is then collected, strained, and stored. The strained juice is mixed with brown sugar, and one glass is drunk each day for three days. Dried leaves may also be

used, in which case they should be soaked overnight in a small quantity of water before crushing and pressing.

Rumex vesicarius L. (Icon.: Zohary, Fl. Palaest. 1: 61, pl. 68, 1966).

VOUCHER SPECIMENS—AG & SMG 4555 and 4584.

LOCALITY—Turbat area.

VERNACULAR NAMES—*trūshpākō*, *trūshpāk*.

USE—The leaves are eaten as a cooked vegetable or fresh salad green.

COMMENTS—Burkill (1909, p. 67) remarked that this plant is eaten in numerous areas of Balochistan. In the Kharan area, where this plant is called *magher*, it is an important famine food (Baluchistan District Gazetteer Series, 1907, vol. VII-A, p. 127). The ripe seeds are dried, winnowed, ground, and often added to flour or used singly. The fresh leaves are also eaten raw or cooked.

CHENOPODIACEAE

Chenopodium album L. (Icon.: Zohary, Fl. Palaest. 1: 142, pl. 200, 1966).

VOUCHER SPECIMEN—AG & SMG 5192.

LOCALITY—Johan area.

VERNACULAR NAME—*jōsāg*.

USE—The boiled leaves are eaten as a vegetable.

COMMENTS—Burkill (1909, p. 63) noted that this plant is eaten in portions of Balochistan.

Chenopodium murale L. (Icon.: Zohary, Fl. Palaest. 1: 142, pl. 202, 1966).

VOUCHER SPECIMEN—AG & SMG 4431.

LOCALITY—Awaran area.

VERNACULAR NAMES—*bāthūā* (U), *gōrāgō* (L).

USE—The leaves are used as a fresh or steamed vegetable.

COMMENTS—The only use of this plant mentioned by Burkill (1909, p. 64) is as fodder for sheep and goats.

Suaeda fruticosa Forssk. ex Gmelin (Icon.: Zohary, Fl. Palaest. 1: 159, pl. 230, 1966).

VOUCHER SPECIMEN—AG & SMG 4871.

LOCALITY—Bella area.

VERNACULAR NAMES—*sōrāg*, *lānnī* (L).

USE—As a tonic for infants.

TREATMENT—Fresh fleshy leaves are crushed and the juice is collected and strained. After a child is born and thoroughly washed, he or she is not nursed for 12 hours. At the end of that period, one teaspoonful of the juice is given to the infant, one hour later a second teaspoonful, and another hour later a third teaspoonful. Thereafter, 14 hours after birth, the mother commences nursing the child. For the next three days, one teaspoonful of the extract is given twice per day. Our informant, a male, did not know the specific function of this treatment and considered it a type of tonic.

COMMENTS—Burkill (1909, p. 64) noted this plant to have several utilitarian purposes, but mentioned nothing about medicinal use.

VOUCHER SPECIMEN—AG & SMG 4793.

LOCALITY—Pasni area.

VERNACULAR NAME—*kāl*.

USES—To relieve pain in the limbs or joints, and to help set hairline bone fractures.

TREATMENT—The root is crushed and boiled in water until the liquid thickens, then strained and temporarily stored. This ointment is rubbed on the part of the body with pain and the area is then covered with a bandage.

Suaeda nudiflora (Willd.) Moq.

syn.: *Salsola nudiflora* Willd.

VOUCHER SPECIMEN—AG & SMG 4971.

LOCALITY—Zeedi area.

VERNACULAR NAMES—*rīghāt* (Br), *rīght* (Br).

USES—To relieve constipation in infants (one week to three years old) and to treat ringworm (*māmmōr*, Br).

TREATMENTS—The fresh leaves are ground to a fine paste, then mixed with one tablespoonful of milk and fed directly to the infant. Two doses are given on a single day, a dosage generally sufficient to relieve constipation. The amount of leaf material used depends on the age of the child: young babies up to eight months old get 3 or 4 g per dosage, and the amount is gradually increased to a maximum of 10 g for children up to three years old.

For ringworm treatment, the juice of fresh leaves is applied directly to the infected area three or four times per day for four to five days.

COMMENTS—Burkill (1909, p. 65) noted that this plant is used as animal fodder.

MENISPERMACEAE

Cocculus hirsutus (L.) Diels (Icon.: Siddiqui, Fl. W. Pak. 74: 8, fig. 3A–L, 1974).

syn.: *Menispermum hirsutum* L.

VOUCHER SPECIMEN—AG & SMG 5035.

LOCALITY—Between Khuzdar and Nal.

VERNACULAR NAME—*zāmbūr*.

USE—To check bleeding of the lower digestive tract, generally bleeding resulting from dysentery.

TREATMENT—Ten to 15 g of slightly crushed leaves (dried or fresh) are placed in a glass of water and shaken vigorously for about one minute. While still foaming, the liquid is sweetened with sugar, stirred, strained, and drunk. If not consumed immediately, the liquid quickly sets to a jellylike consistency. One dose is usually sufficient to stop mild bleeding. In acute cases, a second dose should be given an hour after the first. The medicine is regarded as a coolant, as the bleeding is thought to be the result of heat in the body.

PAPAVERACEAE

Roemeria hybrida (L.) DC. (Icon.: Zohary, Fl. Palaest. 1: 229, pl. 337, 1966).

syn.: *Chelidonium hybridum* L.

VOUCHER SPECIMEN—AG & SMG 5168.

LOCALITY—Kalat area.

VERNACULAR NAME—*pīrpād*.

USE—The fresh leaves are eaten raw as a vegetable.

CAPPARIDACEAE

Capparis decidua (Forssk.) Edgew. (Icon.: Zohary, Fl. Palaest. 1: 244, pl. 361, 1966).

syns.: *Sodada decidua* Forssk.; *Capparis aphylla* Roth.

VOUCHER SPECIMEN—AG & SMG 4574.

LOCALITY—Turbat area.

VERNACULAR NAMES—*kālēdōk*, *kālēdō*.

USES—To relieve pain of the digestive tract, gen-

erally associated with blood in the stools. The fruits are also eaten as a food.

TREATMENT—Five grams of wood ash are pulverized to a fine powder, mixed with one spoon of *ghee* (clarified butter) derived from goat's milk, and taken orally. The standard sequence is three such doses per day for three days, or until bleeding stops. One person mentioned that these symptoms occur after severe physical strain, such as carrying heavy loads, and are often associated with internal pain and blood in the feces.

COMMENTS—Blatter et al. (1919, p. 59) mentioned its use in Balochistan to treat bruises.

VOUCHER SPECIMEN—Not collected.

LOCALITY—Zeedi area.

VERNACULAR NAME—*kālēr*.

USE—To treat gum disease and tooth decay.

TREATMENT—The fresh bark and tender shoots are ground into a paste and applied directly to the gums. This treatment kills worms that burrow into the teeth and excavate cavities.

VOUCHER SPECIMEN—Not collected.

LOCALITY—Pasni area.

VERNACULAR NAME—*kālēr*.

USE—To strengthen the back and relieve back pain.

TREATMENT—One to 1½ kg of tender young shoots are boiled in a pot with enough water to completely cover the plant parts. After two or three hours a thick liquid forms, which is then strained and reheated at a lower temperature until it becomes semisolid. This gumlike substance is rolled into pea-size balls. Single balls are swallowed each day with *ghee* (clarified butter) and milk in the early morning and late evening for three days. Immediately after taking the medicine, the patient should remain inactive for two or three hours.

VOUCHER SPECIMEN—Not collected.

LOCALITY—Bella area.

VERNACULAR NAMES—*kālēr*, *kārār* (L).

USE—To treat ear infection.

TREATMENT—Young branches are crushed and pressed to obtain juice, which is then strained. One or two drops of the extract are put directly deep into the ear. A second application is given 30 minutes after the first and two more doses sometime later that same day. Thereafter, four applications are given per day until the infection is cured. One person mentioned that pain after administration of the medicine is a good sign, because it means that the infection is rupturing.

VOUCHER SPECIMEN—Not collected.

LOCALITY—Turbat area.

VERNACULAR NAME—*kālēr*.

USE—Acts as a coolant.

TREATMENT—Young shoots are soaked in one glass of water overnight, then, in the morning, the extract is strained and drunk before breakfast. This treatment also stops the rupturing of blood vessels in the nose during hot weather.

COMMENTS—Our informant, a Pathan Baloch, also mentioned that beans (*backling*) should not be eaten fresh in hot weather, as they are believed to cause rupturing of blood vessels in the nose.

CRUCIFEREAE

Brassica juncea Czern (Icon.: Jafri, Fl. W. Pak. 55: 25, tab. I, fig. 2, 1973).

VOUCHER SPECIMEN—AG & SMG 5226.

LOCALITY—Kalat area.

VERNACULAR NAME—*jāmbō*.

USES—Oil extracted from seeds is used for cooking, hair lotion, and as a medium for ointments. Boiled leaves are also eaten as a vegetable. The plant is important fodder for domestic animals.

Cardaria draba (L.) Desv. (Icon.: Jafri, Fl. W. Pak. 55: 67, fig. 7A–B, 1973).

syn.: *Lepidium draba* L.

VOUCHER SPECIMEN—AG & SMG 5025.

LOCALITY—Khuzdar area.

VERNACULAR NAME—*gārbūst*.

USE—The young leaves are eaten raw as a vegetable.

COMMENTS—Blatter et al. (1919, p. 57) mentioned the same use of this plant in Balochistan and noted that *gārbūst* is a local generic name for various unrelated edible plants.

Erysimum griffithianum Boiss. (Icon.: Jafri, Fl. W. Pak. 55: 241, fig. 30N–Q, 1973).

VOUCHER SPECIMEN—AG & SMG 5135.

LOCALITY—Kalat area.

VERNACULAR NAME—Not recorded.

USE—Important fodder for domestic animals.

Microsisymbrium flaccidum Schulz (Icon.: Jafri, Fl. W. Pak. 55: 256, fig. 33F–H, tab. V, fig. 11A–B, 1973).

VOUCHER SPECIMEN—AG & SMG 5031.

LOCALITY—Khuzdar area.

VERNACULAR NAME—*jhāmbō*.

USE—The fresh leaves are eaten as a vegetable.

CAESALPINIACEAE

Cassia italica (Mill.) Lam. ex F. W. Andr. (Icon.: Ali, Fl. W. Pak. 54: 16, fig. 3A–C, 1973).

syn.: *Cassia obovata* Collad.; *Senna italica* Mill.

VOUCHER SPECIMEN—AG & SMG 4864.

LOCALITY—Jhal Jao area.

VERNACULAR NAME—*māirō mǎz*.

USE—As a coolant.

TREATMENT—The aerial portions are ground to a fine paste and applied to the forehead and the heels of the feet to draw out fever and internal heat. Used once or twice per day for as long as needed.

COMMENTS—Burkill (1909, p. 28) remarked that the only utility of this plant in Balochistan is as a dye.

Parkinsonia aculeata L. (Icon.: Rechinger, Fl. Iran. 160: 9, tab. 7, 1986).

VOUCHER SPECIMEN—AG & SMG 4792.

LOCALITY—Pasni area.

VERNACULAR NAME—*bāboor*.

USE—To relieve pain in the heels, limbs, and joints.

TREATMENT—Dried root, leaves, flowers, and stems are finely ground. About 5 g of the powder are swallowed with a glass of water twice per day, in the morning and evening, for two to four days.

COMMENTS—This plant was introduced into Balochistan.

MIMOSACEAE

Acacia jacquemontii Benth. (Icon.: Ali, Fl. W. Pak. 36: 13, fig. 4D–J, 1973).

VOUCHER SPECIMEN—AG & SMG 4562.

LOCALITY—Turbat area.

VERNACULAR NAME—*chāgīrd*.

USE—To induce spontaneous abortion in women in any stage of pregnancy.

TREATMENT—About 100 g of fresh bark collected from older trees are boiled in one glass of water. When $\frac{3}{4}$ of the liquid remains, the decoction is strained, cooled, and drunk. The standard treatment is to administer three such doses per day for three days. It was mentioned that this treatment is used only when the fetus is suspected of being malformed or the water sack ruptures prematurely.

COMMENTS—Burkill (1909, p. 29) only noted utilitarian uses of this plant in Balochistan.

Acacia nilotica (L.) Delile (Icon.: Rechinger, Fl. Iran. 161: 4, tab. 4 & 5, 1986).

syns.: *Mimosa nilotica* L.; *Acacia arabica* (Lam.) Willd.

VOUCHER SPECIMEN—Not collected.

LOCALITY—Pasni area.

VERNACULAR NAME—*bābār*.

USE—As a tanning agent, particularly for water sacks (*māshk*).

PROCEDURE—Several handfuls of chipped bark are boiled in a bucket of water until the extract turns dark brown. The animal skin is then filled with the extract and left in that condition for 10 to 15 days, or until it feels soft and pliable. At the end of this period the contents are poured off and the skin may immediately be used to transport water. Generally, two or three days into the tanning process the hair falls off the skin.

PAPILIONACEAE

Alhagi maurorum Medic. (Icon.: Täckholm, St. Fl. Egypt, 2nd ed., 272, pl. 86C, 1974).

syn.: *Alhagi camelorum* Fisch.

VOUCHER SPECIMEN—AG & SMG 4428.

LOCALITY—Awaran area.

VERNACULAR NAMES—*jīwāsā*, *shīz*.

USE—To relieve soreness of the eyes.

TREATMENT—A quantity of fresh leaves is crushed, then pressed, and the juice is collected and strained. One to three drops are placed in the affected eyes, and redness or soreness is quickly

relieved. When fresh material of the plant is not available, the dried leaves are mixed with a fragment of antimony oxide and ground to a fine powder, and a small quantity is applied directly to the eye with a fine rod.

COMMENTS—Burkill (1909, p. 26) noted that near Ormara and Bella, a decoction made from the root of this plant is used as an external treatment for abscesses and swellings.

VOUCHER SPECIMEN—AG & SMG 4973.

LOCALITY—Zeedi area and between Khuzdar and Nal.

VERNACULAR NAMES—*shīz*, *shēz*.

USE—To purify blood, which in turn helps to activate muscles, increase sexual drive, and increase urine flow. Also used to treat infertility in women.

TREATMENT—Approximately 250 g of root are crushed and soaked, along with a small amount of candied sugar (*misri*), in a glass of water overnight. In the morning, before breakfast, the liquid is strained and drunk. The usual dosage is one glass per day for seven to ten days.

In the area between Khuzdar and Nal, this plant is used to treat infertility in women. About 1 kg of root is boiled in 4 L of water, and when $\frac{3}{4}$ of the liquid is gone about 250 g of candied sugar (*misri*) are added. The decoction is then strained. Approximately 250 g of each of the following are mixed together and ground: the meat of coconut, walnuts, almonds, and pistachios, and seeds of watermelon. This mixture is then combined with $\frac{1}{4}$ L of olive oil and the *shēz* decoction. It is slowly heated with occasional stirring until it becomes a thick paste, which is then allowed to set. The standard dose is one small piece of the mixture taken orally before sunrise and another before bedtime. Generally this treatment is repeated each day for 12 days. No water should be drunk within two hours after the mixture is eaten. Also, no rice, beef, potatoes, or other foods that cause stomach gas should be consumed by the patient during the treatment period. If a woman does not conceive within a menstrual cycle, the treatment is repeated. This medicine is thought to "open up" the cardiovascular system and thus help regulate the flow of blood in the body, specifically in the uterus.

COMMENTS—In the Baluchistan District Gazetteer Series (1907, vol. VI-B, pp. 234–235), it is mentioned that in the Pab Range to the east of Wad, the fruits are eaten by people for nourishment, and goats and sheep graze on the leaves.

Indigofera oblongifolia Forssk. (Icon.: Ali, Fl. W. Pak. 100: 71, fig. 10G–N, 1977).

syn.: *Indigofera paucifolia* Del.

VOUCHER SPECIMEN—AG & SMG 4814.

LOCALITY—Pasni area.

VERNACULAR NAME—*shīmmīl*.

USE—The leaves are used as a substitute for *Myrtus communis* (*mōrt*, see p. 31) to treat skin rash and stomach pain.

Taverniera cuneifolia (Roth) Arn. (Icon.: Ali, Fl. W. Pak. 100: 324, fig. 45B–D, 1977).

syns.: *Hedysarum cuneifolium* Roth; *Taverniera nummularia* sensu Burkill, *pro parte auct. non* DC.

VOUCHER SPECIMEN—AG & SMG 4815.

LOCALITY—Pasni area.

VERNACULAR NAMES—*oedīchk*, *oodīchk*.

USE—To relieve muscle and joint pain.

TREATMENT—The aerial portions are crushed and ground into fine paste. This is then applied directly to skin over the sore muscle or joint, generally twice per day for four to six days.

Taverniera spartea (Burm. f.) DC. (Icon.: Ali, Fl. W. Pak. 100: 324, fig. 44G–K, 1977).

syns.: *Hedysarum spartium* Burm. f.; *Taverniera nummularia* sensu Burkill *pro parte*.

VOUCHER SPECIMEN—AG & SMG 4565.

LOCALITY—Turbat area.

VERNACULAR NAME—*lāntū*.

USES—To help heal broken bones and relieve pain associated with joint injury.

TREATMENTS—The aerial portions are crushed and ground to a paste, which is spread on the inner surface of bandages. The treated bandages are then wrapped tightly around the skin area overlying the broken bone. The dressing should be changed every three days. For hairline fractures this treatment is continued for about one week, and for compound fractures for two or three weeks.

The juice of the plant is applied directly to the skin overlying swollen or sore joints and the skin is bandaged. This quickly relieves pain, although

it usually takes 10 to 12 days for the traumatized area to heal completely. The bandages should be changed every three days.

COMMENTS—Burkill (1909, p. 112) was unable to identify a coarse small herb in Makran, called *lāntū*, that was used to treat broken bones. He also mentioned (1909, p. 26) that *T. nummularia* is a fodder plant for domestic animals.

Tephrosia apollinea (Delile) Link (Icon.: Rechinger & Ali, Fl. Iran. 157: 46, tab. 28, 1984).

syn.: *Galega apollinea* Delile.

VOUCHER SPECIMEN—AG & SMG 4865.

LOCALITY—Jhal Jao area.

VERNACULAR NAME—*māīrō*.

USES—To relieve constipation in children, and as laundry soap.

TREATMENT AND PROCEDURE—The root bark is removed and crushed into a mash. A small quantity of it is swallowed in the morning and again in the evening, and the constipation passes. If necessary, this treatment can be continued for two or three days. For a laundry soap, the aerial portions of the plant are crushed, then pressed, and the extract is used to wash clothes.

VOUCHER SPECIMEN—AG & SMG 4556.

LOCALITY—Turbat area.

VERNACULAR NAME—*mātkē nōk*.

USE—To help relieve dehydration and associated fatigue, particularly during the hot summer months.

TREATMENT—Approximately 250 g of fresh aerial parts are chopped into fine pieces and soaked overnight in a bucket of water. The following morning the extract is strained and used as bath-water. This procedure is repeated on three consecutive mornings.

Trigonella anguina Delile (Icon.: Townsend, Fl. Iraq 3: 93, pl. 14, fig. 14, 1974).

VOUCHER SPECIMEN—AG & SMG 4797.

LOCALITY—Pasni area.

VERNACULAR NAME—*shīmsh*.

USE—The aerial portions are eaten raw or cooked as a vegetable.

ZYGOPHYLLACEAE

Fagonia bruguieri DC. (Icon.: Ghafoor, Fl. W. Pak. 76: 11, fig. 2, 1974).

VOUCHER SPECIMEN—AG & SMG 5211.

LOCALITY—Johan and Kalat area.

VERNACULAR NAME—*kārkāwāg*.

USE—For liver ailments.

TREATMENT—Between 15 and 20 g of green or dried herb are soaked in 1 L of water for 12 hours. At the end of this period the extract is strained, then stored temporarily. One cupful of the extract is drunk three times a day for about seven days. The disease so treated is characterized by an enlargement of the liver that can be felt externally.

Fagonia indica Burm. f. (Icon.: El-Hadidi, Fl. Iran. 98: 5, tab. 5, 1972) and *F. olivieri* DC. (Icon.: El-Hadidi, Fl. Iran. 98: 4, tab. 3, 1972).

VOUCHER SPECIMENS—AG & SMG 4407 (*olivieri*) and 4413 (*indica*).

LOCALITY—Awaran area.

VERNACULAR NAMES—*kārkāwāg*, *kārkā* (U).

USE—To relieve high fever, such as malarial fever. Acts as a coolant.

TREATMENTS—These two species are gathered when in flower, not in seed, and may be substituted for one another. About 1 kg of aerial parts is soaked in a bucket of water overnight; in the morning the extract is strained and used as bathwater. For oral administration about 50 g are soaked in a glass of water overnight, and in the morning the infusion is strained and drunk. The treatment is repeated daily for as long as needed. Dry plant material can also be used, in which case the quantity for both preparations should be doubled.

Fagonia indica Burm. f. var. *indica* (Icon.: El-Hadidi, Fl. Iran. 98: 5, tab. 5, 1972).

VOUCHER SPECIMEN—AG & SMG 4570.

LOCALITY—Turbat area.

VERNACULAR NAME—*kārkāwāg*.

USE—To relieve thirst in heat stroke victims.

TREATMENT—About 50 g of plant material (fresh or dried) are ground to a fine powder, mixed with one glass of water, and drunk. This immediately relieves the urge to drink a large quantity of water, which, if so consumed, is believed sometimes to

kill a heat stroke victim. The standard treatment is two doses per day for two or three days.

VOUCHER SPECIMEN—AG & SMG 4876.

LOCALITY—Bella area.

VERNACULAR NAME—*shīz* (L).

USE—To relieve skin rash and skin allergy.

TREATMENT—About ½ kg of fresh aerial portions is crushed and then pressed to obtain the juice. The juice is strained, mixed with a bucket of water, and used to bathe the body, which helps to dry the rash and relieve the itching. Used whenever needed. One informant mentioned that this plant is commonly eaten by camels, but not by goats or sheep.

Fagonia indica Burm. f. var. *schweinfurthii* Hadidi (Icon.: Ghafoor, Fl. W. Pak. 76: 19, fig. 4, 1974).

syn.: *Fagonia arabica* auct. non L.: Burkill.

VOUCHER SPECIMEN—AG & SMG 4901.

LOCALITY—Mor Range.

VERNACULAR NAME—*jāwāsoo*.

USE—To relieve heat rash.

TREATMENT—About 1 kg of plant parts is crushed and the green juice collected and strained. The strained juice is added to about 10 L of water and used for bathing, particularly during hot weather. Some people use it as a preventative once or twice during the summer months.

COMMENTS—Burkill (1909, p. 16) noted that several different informants from the Las Bella area independently verified that this plant is "pounded and mixed with milk, kept for three days and then rubbed all over the body as a cure for itch." He also mentioned that in numerous areas of Balochistan it is considered good fodder for domestic animals.

Peganum harmala L. (Icon.: El-Hadidi, Fl. Iran. 98: 18, tab. 14, 1972).

VOUCHER SPECIMEN—AG & SMG 4408.

LOCALITY—Awaran area.

VERNACULAR NAMES—*gāndākū*, *hārmāl* (A, F, U).

USES—To exorcise the spells of a *jin* and other evil spirits, to relieve infertility in women, and to relieve womb pain in pregnant women.

TREATMENTS—The seeds of the plant are burned over hot coals and the person under the spell inhales the fumes. In most cases the *jīn* departs quickly.

For infertility in women, which is considered an ailment by the Baloch, fumes from burning seeds are introduced into the vagina by means of a special pipe. Germs that attack sperm are killed by these fumes. This same smoke treatment is used for women well advanced in pregnancy who experience “pain in the womb.” For both ailments, one treatment is usually considered sufficient.

COMMENTS—Burkill (1909, p. 17) remarked that this plant is widely used in Balochistan to drive away evil spirits, and Blatter et al. (1919, p. 91) mentioned that the fumes from burnt seeds are “inhaled by people who are sick in any way.”

VOUCHER SPECIMEN—AG & SMG 4968.

LOCALITY—Between Khuzdar and Zeedi.

VERNACULAR NAMES—*kīsānkūr* (B, Br), *hārmāl* (U).

USES—To relieve stomach gas and pain. Secondly, to suppress excess saliva discharge during sleep.

TREATMENTS—Between 5 and 10 g of whole seeds are swallowed with water after any meal when excess stomach gas forms. The same dose is taken in the morning and again in the evening until symptoms disappear. To suppress excess saliva flow, two or three seeds are taken orally before bedtime.

COMMENTS—Near Shahrig in northern Balochistan, the seeds of this plant are used to treat indigestion (Burkill, 1909, p. 17). In the Baluchistan District Gazetteer Series (1907, vol. VI-B, pp. 240–241) it is noted that in the Jhalawan area the seeds are used to treat stomach pain and as an incense for driving away evil spirits.

***Tribulus longipetalus* Viv.** (Icon.: Ghafoor, Fl. W. Pak. 76: 23, fig. 5A–D, 1974).

syn.: *Tribulus alatus* Del.

VOUCHER SPECIMEN—AG & SMG 5047.

LOCALITY—Between Khuzdar and Nal.

VERNACULAR NAME—*gūrgāndākō* (Br).

USE—To break up thick mucus in nasal passages.

TREATMENT—Ripe fruits are ground to a fine powder and used as snuff. Two or three applica-

tions per day are usually considered sufficient, but it can be used whenever needed.

COMMENTS—The only use of this plant mentioned by Burkill (1909, p. 16) is as fodder for domestic animals.

***Zygophyllum eurypterum* Boiss. et Buhse** (Icon.: Ghafoor, Fl. W. Pak. 76: 32, fig. 6K–N, 1974).

syn.: *Zygophyllum atriplicioides* Fisch & Mey. ssp. *eurypterum* (Boiss. & Buhse) M. Pop.

VOUCHER SPECIMEN—AG & SMG 5050.

LOCALITY—Between Khuzdar and Nal.

VERNACULAR NAME—*āloonj*.

USES—To relieve heart burn and palpitation. Also used as a general tonic.

TREATMENT—Between 10 and 15 g of dried fruits and leaves are soaked in a cup of water overnight. In the morning the infusion is strained and drunk before breakfast. It should be taken once a day for as long as needed. This disorder is thought to result from eating spoiled food or from a poor diet, both of which may cause stomach gas and heart burn.

COMMENTS—Blatter et al. (1919, p. 90) noted that this plant is extensively grazed by camels.

***Zygophyllum propinquum* Dcne.** (Icon.: Ghafoor, Fl. W. Pak. 76: 28, fig. 6A–F, 1974).

syn.: *Zygophyllum coccineum sensu* Burkill et auct. Pl., non L.

VOUCHER SPECIMEN—AG & SMG 4412.

LOCALITY—Labach area.

VERNACULAR NAME—*khāar* (B, S).

USE—As a laundry soap.

PROCEDURE—The entire plant, including the roots, is crushed, pressed, and the juice collected. The juice is then mixed with a small amount of caustic soda and boiled. When the liquid becomes semisolid, it is removed from the cooking vessel and spread on flat rocks in the sun to solidify. It was mentioned that this soap is effective for removing general dirt, but essentially useless for oil-based stains.

VOUCHER SPECIMEN—AG & SMG 4563.

LOCALITY—Turbat area.

VERNACULAR NAME—*shōrduh*.

USE—To relieve toothache and infection or inflammation of gums.

TREATMENT—The ash of burned bark is ground and applied directly to an infected tooth or portion of the gums. Application brings quick relief and can be repeated whenever needed.

RUTACEAE

Haplophyllum tuberculatum (Forssk.) A. Juss.
(Icon.: Hassan-ud-din & Ghazanfar, Fl. Pak. 132: 6, fig. 2A–B, 1980).

syn.: *Ruta tuberculata* Forssk.

VOUCHER SPECIMENS—AG & SMG 4978 and 5021.

LOCALITIES—Zeedi area and between Khuzdar and Nal.

VERNACULAR NAME—*gāndrēm*.

USES—To relieve acute cough, fever, and nasal or chest congestion.

TREATMENTS—At Zeedi, about 250 g of leaves, flowers, and tender shoots mixed together are crushed and then boiled in ½ L of water. The patient inhales the vapors. When ½ cup of the liquid remains, it is strained and drunk. This procedure is repeated once per day for three or four days and is used to treat all of the above complaints.

The treatment used in the Khuzdar and Nal area is 10 to 15 g of aerial parts boiled in a glass of water. When ½ of the liquid remains it is strained and drunk. One dose is considered sufficient to relieve symptoms.

COMMENTS—In the Baluchistan District Gazetteer Series (1907, vol. VI-B, pp. 236–237), it is noted that “*gandarēm*” was used throughout the Jhalawan area to treat cough in people and camels.

BURSERACEAE

Commiphora wightii (Arn.) Bhandari (Icon.: Abedin & Ali, Fl. W. Pak. 26: 3, fig. 1J–Q, 1972).

syns.: *Balsamodendron wightii* Arn.; *Commiphora mukul* (Hooks ex Stocks) Engl.

VOUCHER SPECIMEN—AG & SMG 4874.

LOCALITY—Bella area and Mor Range.

VERNACULAR NAME—*gūgār* (B, L).

USES—Near Bella, the gum is used as a snake repellent and the ripe fruits are eaten as food. In the Mor Range the gum is used to relieve back, limb, and muscle pain, as well as stomach gas.

PROCEDURE—Exuded gum from old wood is placed on burning coals. The smoke produced is thought to be noxious to snakes. When these animals are suspected of resting or hiding in a structure, such as a house, the area is fumigated and the snakes are subsequently driven away.

TREATMENTS—To treat back, limb, and muscle pain, collected gum is slightly heated, mixed with honey or *ghee* (clarified butter), and rolled into pea-size balls. Two balls are swallowed per day; in acute cases for ten to fifteen days, and in mild cases for five to seven days. These same balls are used to treat stomach gas. In serious cases, two balls should be taken orally three times per day for three or four days; in mild cases, one ball three times per day for three or four days.

COMMENTS—Burkill (1909, p. 18) noted that near Bella, *Commiphora* gum is used to relieve stomachache.

EUPHORBIACEAE

Andrachne aspera Spreng. (Icon.: Radcliffe-Smith, Fl. Pak. 172: 41, fig. 8H–L, 1986).

VOUCHER SPECIMEN—AG & SMG 4568.

LOCALITY—Turbat area.

VERNACULAR NAME—*shīrāghō*.

USE—To help dry up and heal pimples (*chīpōk*).

TREATMENT—Between 15 and 20 g of aerial portions are crushed and mixed with mustard oil to form a paste. This poultice is applied directly to pimples twice per week until they dry up.

VOUCHER SPECIMEN—AG & SMG 4974.

LOCALITY—Zeedi area.

VERNACULAR NAME—*toot mēkh*.

USES—As a coolant and to decorate the eyes.

TREATMENT—A quantity of root is crushed and pressed. The collected juice is placed in a container overnight with a piece of antimony oxide floating in it. The following morning the antimony is removed and the liquid is placed in the sun to dry. The resulting residue is ground to a fine powder and a small amount is placed in the corner of the eyelid(s) whenever needed. Acts as a coolant.

Chrozophora oblongifolia (Delile) Adr. Juss. ex Spreng. (Icon.: Radcliffe-Smith, Fl. Pak. 172: 51, fig. 10A–D, 1986).

syns.: *Croton oblongifolium* Del.; *Chrozophora obliqua sensu* Muell.-Arg. et auct. Pl., pro parte.

VOUCHER SPECIMEN—AG & SMG 4426.

LOCALITY—Awaran area.

VERNACULAR NAME—*pārsānd*.

USE—To help the healing of minor wounds and pimples.

TREATMENT—Green leaves are crushed and pressed, and the collected juice is rubbed directly on the infected area. The ointment is best made from green leaves. However, when green leaves are not available, dried leaves ground to a fine powder can be mixed with oil.

COMMENTS—Blatter et al. (1920, p. 270) and Burkill (1909, p. 69) noted that members of this genus were used in various areas of Balochistan as color dyes.

Euphorbia talaina A. Radcliffe-Smith (Icon.: Radcliffe-Smith, Fl. Pak. 172: 157, fig. 33A–D, 1986).

VOUCHER SPECIMEN—AG & SMG 4393.

LOCALITY—Awaran area.

VERNACULAR NAME—*kōhī bhāng*.

USES—As a euphoriant, and to relieve urinary tract problems.

PROCEDURE AND TREATMENT—About 10 g of fresh plant material are pressed, and the extracted juice is collected and mixed with a small amount of water. This diluted juice is added to crushed almonds, poppy seeds (known locally as *khāsk-hāsh*, *Papaver somniferum* L.), and sugar, and then drunk. Our informant mentioned that the mixture does not cause hallucinations in any dose, nor does it disturb mental peace; rather, it produces a mild state of euphoria and drowsiness.

The extracted juice, less the other ingredients, is used to treat urinary tract and bladder infections. This treatment is also considered useful in males to stop dripping of urine from the penis, but the specifics of its usage were not described.

Euphorbia caducifolia Haines (Icon.: Radcliffe-Smith, Fl. Pak. 172: 118, fig. 24A–B, 1986).

VOUCHER SPECIMEN—AG & SMG 4417.

LOCALITY—Ladach area.

VERNACULAR NAMES—*dēdār*, *thōr* (S, U).

USES—To relieve backache, particularly in pregnant women, to expel retained placental tissue in women after childbirth, and to increase male sexual vigor.

TREATMENTS—To relieve backache, about 10 g of the inner pulp of stems, including the latex, are removed and combined with brown sugar. This dose is administered orally twice per day until the symptoms disappear. The same treatment can be used to induce the discharge of retained placental tissue. A small quantity (less than 2 g) of latex taken orally by males before sexual intercourse is reputed to increase prowess.

VOUCHER SPECIMEN—AG & SMG 4866.

LOCALITY—Bella area.

VERNACULAR NAME—*thōār* (L).

USE—To treat sarcoptic mange in camels.

TREATMENT—The white milky juice obtained from the plant is rubbed directly onto infected areas of the camel's body. Generally, the treatment is given twice or thrice a week, and, if not totally effective, is repeated a second time (fig. 13).

Euphorbia granulata Forssk. (Icon.: Radcliffe-Smith, Fl. Pak. 172: 101, fig. 18D–F, 1986).

VOUCHER SPECIMEN—AG & SMG 4468.

LOCALITY—Awaran area.

VERNACULAR NAME—*shimsh*.

USE—As hair oil, particularly to make hair straight and shiny.

PROCEDURES—The aerial portions of this plant together with *Plantago lanceolata* (AG & SMG 4449B) are crushed and the resulting oily paste is combed into the hair.

COMMENTS—Near Bella this plant is considered a blood purifier and is also important as goat fodder (Burkill, 1909, p. 68).

ANACARDIACEAE

Pistacia khinjuk Stocks (Icon.: Nasir, Fl. Pak. 152: 13, fig. 4A, 1983).

syn.: *Pistacia acuminata* Boiss. & Buhse.

VOUCHER SPECIMEN—AG & SMG 4571.

LOCALITY—Turbat area.



FIG. 13. *Euphorbia caducifolia* growing 45 km west of Bella at edge of Las Bella basin. The plant is in flower. (Photo taken 23 March 1990 by S. M. Goodman.)

VERNACULAR NAME—*gwān gīr*.

USE—To relieve backache, particularly dull pain associated with muscle spasms.

TREATMENT—Between 10 and 15 g of leaves and bark are crushed and combined with one cup of water. This is allowed to stand for a few hours until it becomes semisolid, then it is strained and taken orally. This dosage is generally taken twice per day, once in the morning and again in the evening, until the symptoms disappear.

VOUCHER SPECIMEN—AG & SMG 4586.

LOCALITY—Turbat area.

VERNACULAR NAME—*gwān*.

USES—To facilitate healing of first- and second-degree burns. The ripe fruits, which are rich in oil, are roasted and eaten as food.

TREATMENT—For burns, the leaves and branches are burned and the ash pulverized, then mixed with oil (preferably olive or mustard), and the ointment applied directly to burns. The wound should not be covered with a bandage during treatment.

The ointment is reapplied each day until the burn has healed.

COMMENTS—The fruits are also eaten in other areas of Balochistan (Burkill, 1909, p. 20). Aitchison (1890, p. 157) mentioned that the resin is used in Balochistan to help the healing of wounds and sores.

SAPINDACEAE

Dodonaea viscosa (L.) Jacq. (Icon.: Abdullah, Fl. W. Pak. 39: 3, fig. 1A-E, 1973).

syn.: *Ptelea viscosa* L.

VOUCHER SPECIMEN—AG & SMG 4590.

LOCALITY—Turbat area.

VERNACULAR NAME—*gēytēchāk*.

USES—To relieve irritation of the throat, generally associated with heavy cigarette smoking, and also nasal congestion.

TREATMENTS—For throat irritation, dried leaves are burned over hot coals in a water pipe and the smoke is inhaled. For nasal congestion, dried leaves are ground to a fine powder and used as a snuff. Both treatments can be used whenever needed.

COMMENTS—Burkill (1909, p. 20) remarked that near Ormara the juice of this plant was used to wash swellings, and in the Harboi Hills it was used as a poultice. The Baluchistan District Gazetteer Series (1907, vol. VI-B, pp. 234–235) notes that in the Kirthar Range of Jhalawan, the leaves are pounded to a mash and applied as a poultice to help wounds heal.

RHAMNACEAE

Zizyphus nummularia (Burm. f.) Wight & Arn.
(Icon.: Kaiser & Nazimuddin, Fl. Pak. 140: 12, fig. 3A–G, 1981).

syn.: *Rhamnus nummularia* Burm. f.

VOUCHER SPECIMEN—AG & SMG 4873.

LOCALITY—Bella area.

VERNACULAR NAMES—*kūnār*, *bēr* (L).

USE—To relieve dysentery.

TREATMENT—The fruits are crushed and ground into a fine paste. One or two tablespoonfuls of the paste are swallowed each day for three to four days, or until symptoms disappear.

TILIACEAE

Corchorus depressus (L.) Stocks (Icon.: Browicz, Fl. Iran. 148: 2, tab. 1, 1981).

syns.: *Antichorus depressus* L.; *Corchorus antichorus* Reusch.

VOUCHER SPECIMENS—AG & SMG 4880 and 4902.

LOCALITIES—Bella area and Mor Range.

VERNACULAR NAME—*mündērī*.

USES—To relieve irritation and pain during urination, and as a general coolant, particularly during the summer months.

TREATMENTS—At Bella, both uses entail the same preparation. About 15 g of the entire herb are soaked in one cup of water. After an hour the extract is strained and drunk. The usual dosage to treat urinary tract problems is one cup in the

morning and another in the evening each day for one week. As a coolant, it can be taken as needed, but never more than two doses per day.

In the Mor Range, between 150 and 200 g of fresh material are crushed and the juice is collected, mixed with one cup of water and a small amount of sugar, and drunk. This dose is taken once in the morning and again in the evening for three consecutive days.

COMMENTS—Blatter et al. (1919, p. 89) mentioned the use of this plant as a coolant in Balochistan.

VOUCHER SPECIMEN—AG & SMG 5049.

LOCALITY—Between Khuzdar and Nal.

VERNACULAR NAME—*mündērī*.

USES—As a coolant, particularly for excess heat in the liver and stomach. Also thought to increase male fertility by thickening semen and strengthening erection.

TREATMENTS—About 100 g of the whole plant are washed, crushed, and then soaked in one glass of water. Early the following morning, before sunrise, the extract is strained and drunk. The liquid becomes thick, sometimes even gelatinous. As a coolant, this dose is taken once per day for as long as needed. It takes about seven days of such treatment to thicken semen.

Grewia erythraea Schweinf. (Icon.: Browicz, Fl. Iran. 148: 10, tab. 6, 1981).

syns.: *Grewia populifolia* Vahl *pro parte*; *G. tenax* ssp. *makranica* (Rech. f. & Esfand.) Browicz.

VOUCHER SPECIMEN—AG & SMG 4875.

LOCALITY—Bella area.

VERNACULAR NAMES—*cātārch*, *gāngī* (L).

USE—The ripe fruits are eaten as food.

COMMENTS—Burkill (1909, p. 15) noted that in the Jhalawan area the fruits are eaten by people, a decoction made from the wood is taken to relieve cough and pain in the side, and the plant provides fodder for animals.

MALVACEAE

Abutilon muticum (Delile ex DC.) Sweet (Icon.: Abedin & Ali, Fl. W. Pak. 130: 71, fig. 16C–D, 1979).

syn.: *Sida mutica* Delile ex DC.

VOUCHER SPECIMEN—AG & SMG 4872.

LOCALITY—Bella area.

VERNACULAR NAME—*bārr*.

USE—To treat infections caused by plant spines and slivers wedged under the skin.

TREATMENT—The leaves are crushed and applied directly to the injured area of skin, then the area is bandaged for 24 hours. If infection continues, a second treatment is given.

COMMENTS—Our informant mentioned that the fruits were formerly used to obtain a blue cloth dye, but he did not know the particulars of the technique. Burkill (1909, p. 14) noted that near Bella, this plant is fodder for cattle and in times of food scarcity the seeds are eaten by people.

Malva neglecta Wallr. (Icon.: Abedin & Ali, Fl. W. Pak. 130: 38, fig. 8A, 1979).

syn.: *Malva rotundifolia* L.

VOUCHER SPECIMEN—AG & SMG 5175.

LOCALITY—Kalat and Johan area.

VERNACULAR NAME—*pōchikō*.

USE—To relieve indigestion and diarrhea; acts as a coolant.

TREATMENT—The aerial portions are dried, finely ground, and the resulting paste is slightly heated in a pan and then spread across the abdomen. This poultice draws heat from the body, which is thought to cause digestive system disorders. One application is generally sufficient.

COMMENTS—Burkill (1909, p. 13) remarked that this plant is used in the Upper Zhob, near Hindubagh, as a coolant and throughout Balochistan as fodder for domestic animals. Blatter et al. (1919, p. 87) noted that it is employed in a remedy to relieve urine retention.

TAMARICACEAE

Tamarix aphylla (L.) Karst. (Icon.: Qaiser, Fl. Pak. 141: 31, fig. 13A-1, 1982).

syns.: *Thuja aphylla* L.; *Tamarix articulata* Vahl.

VOUCHER SPECIMEN—AG & SMG 4396.

LOCALITY—Awaran area.

VERNACULAR NAME—*gāz*.

USES—After an accident, used to help keep traumatized areas of the body warm. Also used in the construction of buildings and fences (fig. 14).

TREATMENT—Young fresh branches are flattened, partially smashed, placed over the injured area (generally a limb), and then bound to the body with a bandage. These wrappings help keep the patient warm and comfortable until he or she can receive proper medical care. In the case of broken bones, the heavier branches are used as splints.

COMMENTS—In the Baluchistan District Gazetteer Series (1907, vol. VI-A, pp. 157–158 and vol. VII-A, pp. 111–112) there is a review of the uses of tamarisk in the Jhalawan and Kharan areas.

Tamarix dioica Roxb. ex Rodh (Icon.: Qaiser, Fl. Pak. 141: 29, fig. 11A–G, 1982).

VOUCHER SPECIMEN—Not collected.

LOCALITY—Bella area (fig. 15).

VERNACULAR NAME—*gāz*.

USE—To relieve fever in domestic animals.

TREATMENT—The animal is forced to inhale the smoke from dried tender shoots placed on hot coals. This procedure is repeated each morning for three days, after which time the symptoms associated with fever in domestic animals disappear (e.g., sluggishness and inability to stand up for extended periods).

Tamarix stricta Boiss. (Icon.: Assadi, Fl. Iran. 1: 63, fig. 25, [1988]).

VOUCHER SPECIMEN—AG & SMG 4564.

LOCALITY—Turbat area.

VERNACULAR NAME—*gāz*.

USE—To treat weakness and pain of limb joints in goats, cows, and camels—specifically a disease, known as *chāllō*, that causes crippling.

TREATMENT—The oldest portions of bark are peeled off the lower trunk and burned on hot coals. Domestic animals suffering from *chāllō* are forced to inhale the fumes, and they are often noticeably stronger within 24 hours. If the symptoms do not disappear, the treatment is repeated. Tender shoots can be used, but they are considered inferior to the bark.

VOUCHER SPECIMEN—AG & SMG 4820.

LOCALITY—Pasni area.



FIG. 14. Agricultural field just outside of Awaran. The roof of the building in the center is mostly made of *Nannorhops* and *Tamarix* branches and leaves. The main support structure, visible on the building under construction to the left, consists of *Tamarix* timbers and heavy branches. The fields in the background contain ripening wheat. (Photo taken 10 March 1990 by S. M. Goodman.)

VERNACULAR NAME—*gāz*.

USE—To strengthen atrophied muscle.

TREATMENT—The green portions of the plant are crushed and placed on the skin over weak and thin muscles, particularly the leg muscles, then wrapped with a bandage. The dressing is reapplied twice per day, in the morning and evening, for five to ten days. Simultaneous with this treatment, once or twice per day the green portions of the plant are burned on hot coals and the fumes are inhaled by the patient. After this course, the muscles regain strength.

Tamarix indica Willd. (Icon.: Qaiser, Fl. Pak. 141: 5, fig. 1A–F, 1982).

syn.: *T. gallica sensu* Burkill et auct. Pl., non L.

VOUCHER SPECIMEN—Not collected.

LOCALITY—Turbat area.

VERNACULAR NAME—*gāz*.

USE—To help heal skin wounds and traumatic injuries of domestic animals and humans.

TREATMENTS—Several handfuls of shoots and leaves are put in about 10 L of water and boiled until $\frac{1}{4}$ of the liquid remains. The decoction is then strained and further boiled until it becomes semisolid. For domestic animals this ointment is applied directly to open and festering sores each day for one week. For humans with internal or external limb trauma (including major lacerations, hairline bone fractures, and pulled muscles), tender shoots are lightly crushed, heated, and then bound with a bandage to the injured area. In the case of broken bones, the bones are first set, and then this treatment is used.

MYRTACEAE

Myrtus communis L. (Icon.: Qaiser, Fl. Libya 122: 2, fig. 1, 1986).

VOUCHER SPECIMEN—AG & SMG 5208.

LOCALITY—Johan and Kalat area.

VERNACULAR NAME—*mōrt*.



FIG. 15. *Tamarix dioica* growing at the edge of a watercourse, about 18 km west of Bella and within the Las Bella basin. Note the heavily grazed grasses in the foreground. (Photo taken 24 March 1990 by S. M. Goodman.)

USES—Preventative against rash, and to relieve acute stomach pain. The twigs of this tree are also placed on graves to symbolize the virtue of the dead.

TREATMENTS—The leaves are dried, finely ground, and then sieved. The resulting fine powder is applied to armpits, groin, and anus, which prevents and relieves skin rash and also acts as a deodorant.

Approximately 100 g of fresh or dried leaves

are boiled in four cups of water until one cup remains. The liquid is then strained. A few drops of cow's or goat's milk are added to the liquid before it is drunk. One dose is sufficient to treat stomach pain, but the treatment should not be used for dysentery or diarrhea-related ailments.

COMMENTS—This plant has been introduced into Balochistan; it is native to areas of southern Europe, North Africa, and the Middle East. In Balochistan at some high elevations it is a cultivar.

UMBELLIFERAE

Dorema aureum Stocks (Icon.: Nasir, Fl. W. Pak. 20: 155, fig. 46D–G, 1972).

VOUCHER SPECIMEN—AG & SMG 5152.

LOCALITY—Khuzdar area.

VERNACULAR NAME—*ooshī*.

USE—Considered to be excellent fodder for domestic animals.

Zosima absinthifolia (Vent.) Link (Icon.: Nasir, Fl. W. Pak. 20: 168, fig. 50A–C, 1972).

syn.: *Heracleum absinthifolium* Vent.

VOUCHER SPECIMEN—AG & SMG 4594.

LOCALITY—Turbat area.

VERNACULAR NAME—*bārā gwāthāk*.

USE—To relieve indigestion and stomach gas.

TREATMENT—About 10 g of dried aerial parts are ground to a fine powder and swallowed with water. This dosage is taken twice per day, once in the morning and again in the evening, until the symptoms disappear.

COMMENTS—Burkill (1909, p. 36) remarked that this plant is used near Kharan to treat cough and bowel disorders.

OLEACEAE

Olea ferruginea Royle (Icon.: Grohman, Fl. W. Pak. 59: 9, fig. 2A–B, 1974).

syn.: *Olea cuspidata* Wall.

VOUCHER SPECIMEN—AG & SMG 5166.

LOCALITY—Between Nichara and Kalat (fig. 16).

VERNACULAR NAMES—*khāt* (Br), *khōt* (Br).

USES—To relieve diarrhea in adults and children. The leaves are also used to make green tea.

TREATMENT—About 10 g of bark are boiled in one cup of water. When $\frac{1}{2}$ of the liquid remains the decoction is strained and drunk. Two or three doses are given per day for two to three days or until diarrhea symptoms disappear.

COMMENTS—Near Bella the leaves are used to treat gonorrhea and the gum is used for eye diseases; the plant is also grazed by goats and camels (Burkill, 1909, p. 47). The treatment for sore eyes (*bāibār*) in the Sarawan area consists of rinsing them with tobacco water, after which an ointment derived from the gum of this tree is applied (Ba-

luchistan District Gazetteer Series, 1907, vol. VI, p. 221).

SALVADORACEAE

Salvadora oleioides Decne (Icon.: Qureshi, Fl. W. Pak. 29: 3, fig. 1A–D, 1972).

VOUCHER SPECIMEN—AG & SMG 4420.

LOCALITY—Awaran area.

VERNACULAR NAMES—*khābbār* (B, S), *peelū* (U).

USE—To induce vomiting, particularly in cases of food poisoning.

TREATMENT—Fifteen or more fresh fruits are taken orally and immediately thereafter the patient drinks at least two glasses of cold water. This induces vomiting, and the symptoms associated with food poisoning pass.

VOUCHER SPECIMENS—AG & SMG 4868 and 4922.

LOCALITY—Bella area.

VERNACULAR NAMES—*khābbār*, *jār* (L).

USES—To treat rash or sarcoptic mange in camels; as a toothbrush; and as human food.

TREATMENT AND PROCEDURE—To treat rash and sarcoptic mange, wood from older trees is burned to ash, pulverized, and then mixed with mustard oil to form a thick paste. Each day for seven days this ointment is applied directly to the infected area of camel skin.

For use as a toothbrush, the young branches are cut into 10–30 cm lengths, the end of the stick is slightly chewed, causing the fibrous wood to fray, and the chewed branches are used as toothbrushes.

The ripe fruits, *pērū* (L), are regularly eaten by people as food and can be found for sale in local markets. The fruits are often consumed by shepherds while out with their animal flocks.

COMMENTS—Burkill (1909, p. 47) mentioned that near Bella the fruits are eaten as food and the leaves used to treat cough and as a purgative. He further noted that in the Panjgur area the roots are used for the fabrication of toothbrushes.

APOCYNACEAE

Nerium oleander L. (Icon.: Nazimuddin & Qaiser, Fl. Pak. 148: 19, fig. 4D–I, 1983).

syn.: *Nerium odorum* Soland.



FIG. 16. *Olea ferruginea* tree growing in mountainous area at about 1975 m altitude on road between Kalat and Nichara. (Photo taken 12 May 1990 by S. M. Goodman.)

VOUCHER SPECIMEN—AG & SMG 4591.

LOCALITY—Turbat area.

VERNACULAR NAME—*jōr*.

USE—To facilitate healing of skin wounds, particularly open and festering sores.

TREATMENT—The ground ash of burned leaves is applied directly to the injury. The ash should be applied twice per day until the wound has a well-formed scab.

VOUCHER SPECIMEN—Not collected.

LOCALITY—Gwadar.

VERNACULAR NAME—*jōr*.

USE—As an insecticide.

PROCEDURE—For long-term storage of bedding and clothing, a few leaves are placed within the material to repel insects. The leaves and flowers are also dried and then ground to a fine powder for use as a general insecticide dust. It was men-

tioned by an informant that the plant is so poisonous that a few leaves mixed with other foliage and eaten by a cow is enough to kill the animal.

COMMENTS—Burkill (1909, p. 48) noted that near Bella it was thought that all animals, with the exception of goats, would be poisoned if they ate any portion of this plant. It is not used for fuel because the smoke is poisonous to those sitting near the fire (Aitchison, 1890, p. 139).

Rhazya stricta Dcne. (Icon.: Nazimuddin & Qaiser, Fl. Pak. 148: 26, fig. 2A–D, 1983).

VOUCHER SPECIMENS—AG & SMG 4392 and 4418.

LOCALITY—Awaran area.

VERNACULAR NAME—*īshrēk phālī*.

USE—To relieve stomach gas associated with milk digestion problems in nursing children up to five years old.

TREATMENT—Fruits and leaves are dried, powdered, and then mixed with equal parts of *bārā gwāthāk* (*Zosima absinthifolia*, see p. 33) and *tūssū* (*Jaubertia aucheri*, see p. 44) and a “pinch” of sugar. A small amount of this compound medicine, known as *dārpēch*, is administered orally to the child after nursing. The treatment continues until the symptoms disappear.

COMMENTS—In the Jhalawan area the leaves are used to prepare a coolant and drug to purify blood (Baluchistan District Gazetteer Series, 1907, vol. VI-B, pp. 238–239). According to Burkill (1909, p. 48), this plant is used near Bella to treat infant diseases.

VOUCHER SPECIMEN—AG & SMG 4558.

LOCALITY—Turbat area.

VERNACULAR NAME—*īshrēk*.

USES—To relieve red, sore, and swollen eyes. Also utilized as a general coolant.

TREATMENTS—Plant juice pressed from fresh leaves is strained through a fine sieve and then stored. Three drops of the liquid are placed directly in the eye, up to three times per day, to relieve soreness.

The bark and root wood are burned. The resulting coal and ash are mixed with antimony oxide and then finely ground. A small quantity of this mixture is placed on the inner portion of the eyelid. The mixture acts as a general coolant.

COMMENTS—In several areas of southern Balochistan this plant is used to treat eye disease and

as a coolant (Burkill, 1909, pp. 47–48).

VOUCHER SPECIMEN—AG & SMG 4966.

LOCALITY—Zeedi area.

VERNACULAR NAME—*īshrēk*.

USES—To treat jaundice (*kāwāl*), anemia-like symptoms in pregnant women, problems associated with child development (*kāzār*), and skin rash in children.

TREATMENTS—For jaundice, about 100 g of root are slightly crushed and soaked overnight in one cup of water. The following morning the extract is strained and drunk before breakfast. One dose per day is given until the symptoms, particularly yellow-colored skin, have disappeared.

For anemia-like symptoms in pregnant women, the same procedure and dosage described above are followed. The treatment generally commences in the fourth month of pregnancy and continues until the symptoms have disappeared.

For developmental problems in children, the fruits are ground to a fine powder and 2–3 g are placed on the child's tongue each day for up to one week. In acute cases two applications per day are recommended. The symptoms of *kāzār* were described as the child's feces turning green, the head enlarging, and the body shrinking.

To treat skin rashes in children, the leaves and seed pods are dried and finely ground, and the powder is applied directly to the skin. This treatment is used whenever needed.

VOUCHER SPECIMEN—Not collected.

LOCALITY—Khuzdar area.

VERNACULAR NAMES—*kāwīl*, *sāhī* (S).

USES—To treat anemia-like symptoms and relieve eye soreness.

TREATMENTS—A large handful of root is crushed and soaked in one glass of water overnight. In the morning the extract is strained and divided into three equal doses, which are taken after breakfast, after dinner, and just before bed. The treatment is generally continued for one week, and the symptoms disappear slowly.

To treat eye soreness, ripe fruits are cut at the base, the exuded milky juice is collected, and one or two drops are placed directly into the eye. This treatment is used whenever needed.

VOUCHER SPECIMEN—Not collected.

LOCALITY—Pasni area.

VERNACULAR NAME—*īshrēk*.

USES—To help dry up hemorrhoids, as a vermifuge, and to relieve soreness and infection of eyes.

TREATMENTS—Several handfuls of aerial parts are boiled in $\frac{1}{4}$ L of water for $\frac{1}{2}$ hour. The infusion is then strained and reheated until the liquid thickens and becomes semisolid. It is allowed to cool and solidify and is then rolled into pea-size balls. Two balls are taken orally with water each evening for seven consecutive nights. This helps dry up hemorrhoids.

To treat gastrointestinal parasites, the same medicine is used. One ball taken daily before breakfast for three or four days is effective treatment for both round- and flatworms.

For eye soreness, fresh leaves are mixed with candied sugar (*misri*) and antimony oxide, and then finely ground. A small quantity of the powder is placed on the inner surface of the eyelid. Generally it is applied in the morning and evening until the symptoms disappear.

COMMENTS—Near Ormara this plant is used as a vermifuge (Burkill, 1909, p. 47).

VOUCHER SPECIMEN—Not collected.

LOCALITY—Bella area.

VERNACULAR NAMES—*īshrēk*, *sīār* (L).

USE—To relieve colic and stomach pain.

TREATMENT—Leaves and flowers are dried, finely ground, and sieved. About 3 or 4 g of the powder are swallowed with water in the morning, afternoon, and evening each day for three days. Used for both of these ailments.

ASCLEPIADACEAE

Calotropis procera (Ait.) Ait. f. (Icon.: Ali, Fl. Pak. 150: 7, fig. 1A–G, 1983).

VOUCHER SPECIMEN—AG & SMG 4397.

LOCALITIES—Awaran area and between Khuzdar and Nal.

VERNACULAR NAMES—*kārāk*, *ārrīgh* (Br).

USES—To relieve nasal congestion, headache, and pain associated with rheumatism. Also, to whiten teeth.

TREATMENTS—A small quantity of root is dried and finely ground. A few grams of the powder are inhaled as snuff to clear nasal congestion or blockage. Used whenever needed.

Powdered root is placed on hot coals and the resulting fumes are inhaled by persons suffering from headache. This treatment is used whenever

needed. An alternative treatment employed in the Khuzdar and Nal area is to dip a large leaf of this plant in mustard oil and then bind the leaf to the forehead with a cloth. One-half hour of treatment is usually sufficient to relieve head pain. The principal symptom of this ailment, known as *dārd shā-qīqā*, is aching limited to half the head; the condition may well be some type of migraine.

For the treatment of rheumatism, the leaves are slightly warmed in oil and then bound directly to aching joints and limbs. To whiten teeth, the latex is collected, dried, ground, and mixed with toothpaste.

COMMENTS—Near Bella the warmed leaves of this plant are used as a poultice (Burkill, 1909, p. 49). The Baluchistan District Gazetteer Series (1907, vol. VI-A, p. 185) mentions that in the Kachhi area the gum or leaves of *ak* are used to treat pneumonia (*sūmbāk*). In the same series (1907, vol. VI-B, pp. 238–239), it is noted that in the central and lower Jhalawan area, this plant is considered poisonous, although the flowers are eaten by goats. Zaman and Khan (1970, pp. 19–20) review the use of this plant in Pakistan.

VOUCHER SPECIMEN—Not collected.

LOCALITY—Bella area.

VERNACULAR NAMES—*kārāk*, *āk* (L).

USE—As a depilatory, generally for removing hair from armpits and the pubic region.

PROCEDURE—Ash of this plant is ground and then mixed with warm water to form a thick paste. The paste is then applied directly to the skin for 15 minutes in the area of desired hair removal. After this period, the hair can be easily scraped off with a wooden blade.

Caralluma tuberculata N. E. Brown (Icon.: Ali, Fl. Pak. 150: 48, fig. 11A–E, 1983).

syn.: *Boucerosia aucheriana* auct., non Dcne.

VOUCHER SPECIMEN—AG & SMG 4878.

LOCALITY—Bella area.

VERNACULAR NAMES—*āpūtāk*, *āpūtāk*.

USE—Eaten raw as a vegetable.

COMMENTS—Burkill (1909, p. 49) noted that near Bella this plant is called *boteri* and is eaten raw as a vegetable. In the Sarawan area it is used to treat fever: powder of the ground plant is swallowed with cold water (Baluchistan District Gazetteer Series, 1907, vol. VI, p. 221).

Glossonema varians (Stocks) Hook. f. (Icon.: Ali, Fl. Pak. 150: 17, fig. 5A–E, 1983).

syn.: *Mastostigma varians* Stocks.

VOUCHER SPECIMENS—AG & SMG 4794 and 5030.

LOCALITIES—Pasni area and between Khuzdar and Nal.

VERNACULAR NAMES—*shāgūshāk*, *khūrūmb*.

USE—The fruits are eaten raw as a vegetable.

COMMENTS—Burkill (1909, p. 49) reported that the fruits are consumed in various portions of Balochistan.

Periploca aphylla Decne. (Icon.: Ali, Fl. Pak. 150: 58, fig. 13A–D, 1983).

VOUCHER SPECIMEN—AG & SMG 4455.

LOCALITY—Awaran area.

VERNACULAR NAME—*gīshār*.

USE—To dry up pimples or pus-filled sores in the nose or in the margins of the eyelids.

TREATMENT—Flower buds are ground into a thick paste, a small amount of which is applied directly to sores as a poultice three or four times over the course of two days.

COMMENTS—Blatter et al. (1919, p. 177) noted that in Balochistan this plant is considered excellent animal fodder.

CONVOLVULACEAE

Convolvulus spinosus Burm. f. (Icon.: Austin & Ghazanfar, Fl. W. Pak. 126: 12, fig. 1F–I, 1979).

VOUCHER SPECIMEN—AG & SMG 4557.

LOCALITY—Turbat area.

VERNACULAR NAME—*rūtāchāk*.

USE—To relieve constipation.

TREATMENT—About 25 g of bark (the older stems are particularly useful) are ground to a fine powder and then swallowed with water. This treatment is taken once per day, and generally within one or two days the constipation passes. A greater frequency or a larger dose causes diarrhea.

COMMENTS—Burkill (1909, p. 53) noted that near Turbat this plant is considered to be a strong purgative.

VOUCHER SPECIMEN—AG & SMG 4559.

LOCALITY—Turbat area.

VERNACULAR NAME—*dōlkō*.

USE—For postparturition complications in goats and cows when the afterbirth has not been passed. Never to be used for humans.

TREATMENT—The aerial portions are burned and the ash is force-fed to the animal. Within two hours the remaining afterbirth is expelled. For goats, 250 g of fresh portions of the plant are used; for cows, 500 g.

Seddera latifolia Hochst. & Steud. (Icon.: Austin & Ghazanfar, Fl. W. Pak. 126: 61, fig. 8G–H, 1979).

VOUCHER SPECIMEN—AG & SMG 4410.

LOCALITY—Awaran area.

VERNACULAR NAME—*tüssū*.

USE—To relieve problems associated with improper milk digestion and stomach gas in children under the age of five years.

TREATMENT—Leaves and flowers are dried and ground. About ¼ teaspoonful of the powder is given to the child each night before bedtime. Treatment continues until symptoms disappear. This drug is particularly useful when the child is vomiting undigested milk.

COMMENTS—Near Awaran this plant is also used in a compound medicine, known as *dārpēch*, used to treat the same symptoms as described above (see *Rhazya stricta*, p. 35).

BORAGINACEAE

Cordia gharaf (Forssk.) Ehren. ex Asch. (Icon.: Nasir, Fl. Pak. 191: 6, fig. 1A–E, 1989).

syns.: *Cornus gharaf* Forssk.; *Cordia rothii* Roem. & Schult.

VOUCHER SPECIMEN—AG & SMG 4869.

LOCALITY—Bella area.

VERNACULAR NAMES—*dāndānōī* (L), *līār* (L).

USE—To treat jaundice (*kāwāl*).

TREATMENT—About 2 kg of fresh leaves are washed numerous times to remove dirt and insects. They are then placed in a new earthenware pot with 8 to 10 L of fresh water. After two hours the infusion is ready (the leaves are not removed). One glass of the liquid is drunk each day for ten days. Generally the symptoms associated with jaundice start to disappear soon after the treatment

begins and are usually completely gone by the tenth day.

***Cordia macleodii* (Griff.) Hook. f. & Thoms. (Icon.: Nasir, Fl. Pak. 191: 12, fig. 3A–C, 1989).**

syn.: *Hemigymnia macleodii* Griff.

VOUCHER SPECIMEN—AG & SMG 4879.

LOCALITY—Bella area.

VERNACULAR NAMES—*drāgūr*, *dāgūrā* (L).

USES—To thicken semen, and as a coolant.

TREATMENTS—Between 10 and 15 ripe fruits are taken orally by men three to five hours before sexual intercourse. This produces thicker semen, which is thought to contain stronger and more fertile sperm. It was pointed out to us by a man that the use of these fruits has nothing to do with male infertility, but rather increases the likelihood of quick fertilization.

The fruits are also eaten for their coolant properties. The specific details of dosage and frequency were not known to our informant.

***Onosma limitaneum* I. M. Johnston (Icon.: Nasir, Fl. Pak. 191: 97, fig. 26D–F, 1989).**

VOUCHER SPECIMEN—AG & SMG 5197.

LOCALITY—Johan and Kalat area.

VERNACULAR NAME—*chārmāng*.

USE—To relieve chest congestion, particularly that caused by thick phlegm.

TREATMENT—Ten grams of dried plant material are boiled in ½ L of water. When ⅓ of the liquid is left, the decoction is strained and drunk before bed. This treatment is repeated for two or three days. The drug should not be taken in the morning or during the day, as it has a strong sedative effect.

VERBENACEAE

***Vitex agnus-castus* L. (Icon.: Jafri & Ghafoor, Fl. W. Pak. 77: 25, fig. 6A–B, 1974).**

VOUCHER SPECIMEN—AG & SMG 4985.

LOCALITY—Khuzdar area.

VERNACULAR NAME—*gwānīk*.

USES—To relieve bowel problems in children up to three years old, and to treat throat infections.

TREATMENTS—Ten grams of seed are boiled in one cup of water until ¾ of the liquid remains.

The decoction is then strained and stored. One teaspoonful of the liquid is given to the patient twice per day, preferably in the morning and in the evening, for three to four days. If symptoms continue, the treatment is extended for another two days. This disorder is characterized by distinctly soft, but not liquid, stools. It is thought that the problem is related to improper absorption of water in the gastrointestinal tract. The medicine acts as a binder. The cause is believed to be an over-indulgence in sweets, which disturbs the intestinal diverticula.

For the treatment of an infected throat, the seeds are husked and the endosperm is removed and finely ground to a paste. The paste is mixed with a small amount of candied sugar (*misri*) and applied directly to the glottis with a thin stick applicator in the early morning before breakfast and again in midafternoon. The procedure is repeated for three days.

COMMENTS—Burkill (1909, p. 58) mentioned a variety of uses for this plant in Balochistan, all different from those described here. This species is cultivated in Balochistan and is originally native to the eastern Mediterranean region and portions of southwestern and central Asia.

LABIATAE

***Eremostachys loasifolia* Bth. (Icon.: Hedge, Fl. Pak. 192: 143, fig. 14A–D, 1990).**

VOUCHER SPECIMEN—AG & SMG 5027.

LOCALITY—Between Nal and Khuzdar.

VERNACULAR NAME—*dānnān shān* (Br).

USE—To treat gum disease and tooth decay.

TREATMENT—The seeds are burned over hot coals and the smoke is inhaled by the patient and also passed over the gums. This procedure repels worms that have burrowed into the gums and that are the reputed cause of several types of dental disease. Our informant mentioned that the worms can sometimes be seen “falling from gums.”

***Lallemantia royleana* (Benth.) Benth. (Icon.: Hedge, Fl. Pak. 192: 130, fig. 15C–E, 1990).**

syn.: *Dracocephalum royleanum* Benth.

VOUCHER SPECIMEN—AG & SMG 5133.

LOCALITY—Between Nichara and Kalat.

VERNACULAR NAME—*pūrchīnk* (B, Br).

USES—To quench thirst, and as a coolant. Also, fresh greens are eaten as a vegetable and used to flavor a special kind of date preparation.

TREATMENT—A handful of the herb is crushed, placed in one glass of water for 24 hours, strained, and drunk. Used whenever needed.

***Mentha longifolia* (L.) L.** (Icon.: Feinbrun-Dothan, Fl. Palaest. 3: 159, pl. 261, 1977).

syns.: *Mentha spicata* var. *longifolia* L.; *Mentha sylvestris* L.

VOUCHER SPECIMEN—AG & SMG 4972.

LOCALITY—Zeedi area.

VERNACULAR NAME—*pürchīnk* (B, Br).

USES—To relieve dryness of the throat due to thirst, and to stop vomiting caused by extreme temperatures and heat stroke.

TREATMENTS—About 100 g of leaves are crushed, mixed with a small amount of water, pressed, and then the juice is strained. A few drops of the liquid are added to one cup of water along with some sugar and drunk. This standard dose is taken twice per day for up to two days. The extract is used as a general tonic against extreme heat.

The medicine to inhibit vomiting is prepared in a similar way, but the juice is mixed with cardamom (*Amomum aromaticum* Roxb.) and candied sugar (*misri*), then boiled down to a thick syrup, which can be stored. A few drops of the extract are added to a cup of water and the same dosage as mentioned above is followed.

COMMENTS—In northwestern Balochistan, near Shahrig, the leaves are soaked in water and the infusion is taken orally as a coolant (Burkill, 1909, pp. 58–59). It is also used as a coolant in the Jhalawan area (Baluchistan District Gazetteer Series, 1907, vol. VI-B, pp. 242–243).

***Otostegia persica* (Burm.) Boiss.** (Icon.: Rechinger et al., Fl. Iran. 150: 347, tab. 312, 1982).

syn.: *Molucella persica* Burm. f.

VOUCHER SPECIMEN—AG & SMG 4569.

LOCALITY—Turbat area.

VERNACULAR NAME—*gürdër*.

USES—To relieve fever (particularly typhoid), weakness or fatigue, and stomach pain and gas.

TREATMENTS—To relieve excess body heat associated with fever, the aerial portions are dried,

ground, and mixed with mustard or olive oil. This ointment is rubbed over the entire body on alternate nights (during the summer months) or early mornings (during the winter months) for one week.

To stop fatigue, about 25 to 30 g of leaves are soaked in one glass of water overnight. In the morning the infusion is strained and drunk before breakfast. The standard dose is one glass every other day for one week.

The procedure and dose to treat stomach disorders are the same as for the treatment of fatigue, except that in acute cases the herb is not soaked overnight but is boiled in the water for 1½ hours and the decoction is strained, cooled, and drunk, affording immediate relief. This is the most common use of the plant in Makran. When we came across this plant in the Makran area with local guides, they invariably collected some of the herb to take home with them.

COMMENTS—In Sarawan, “*gul gidar*, imported from Makrán, where it is known as *gurdîr*,” is used to treat malarial fever (Baluchistan District Gazetteer Series, 1907, vol. VI, p. 221).

***Salvia aegyptiaca* L.** (Icon.: Rechinger et al., Fl. Iran. 150: 432, tab. 468, 1982).

VOUCHER SPECIMEN—AG & SMG 4959.

LOCALITY—Zeedi area.

VERNACULAR NAMES—*môr*, *māôr*.

USES—To relieve itching of the eyes and burning during urination.

TREATMENTS—Whole seeds are washed in clean water and placed directly in the affected eye. For mild cases of irritation, three seeds are used, and for acute cases, ten seeds. Generally seeds are left in the eye for one hour.

For urinary tract problems, 20 g of the aerial portions are boiled in one cup of water. When ½ of the liquid remains, the decoction is strained, allowed to cool slightly, and drunk. In the standard procedure this dose is repeated every two to three hours between sunrise and sunset on a single day. The principal symptoms so treated are a distinct burning sensation of the vagina or penis during urination and a small amount of urine passed relative to liquid intake. Sometimes there is also pain in the kidneys. The treatment is thought to flush out the urinary system.

COMMENTS—Burkill (1909, p. 59) mentioned that near Pab, in the Bella area, this plant is used to treat eye disease.

Salvia cabulica Benth. (Icon.: Rechinger et al., Fl. Iran. 150, tab. 449, 1982).

VOUCHER SPECIMEN—AG & SMG 5148.

LOCALITY—Between Nichara and Kalat.

VERNACULAR NAME—*mātētō*.

USE—To treat dehydration, particularly during the hot summer months.

TREATMENT—Ten grams of dried or fresh leaves are boiled in one glass of water until $\frac{3}{4}$ of the liquid remains. It is then strained, cooled, and drunk. This treatment is taken whenever needed.

COMMENTS—Used in the Harboi Hills to treat colds and lung disease (Burkill, 1909, p. 59).

Salvia santolinifolia Boiss. (Icon.: Hedge, Fl. Pak. 192: 200, fig. 24A–E, 1990).

VOUCHER SPECIMEN—AG & SMG 5032.

LOCALITY—Between Khuzdar and Nal.

VERNACULAR NAME—*thūssō*.

USE—As a coolant to relieve fever.

TREATMENT—The entire plant is crushed and mixed with mustard oil. This ointment is rubbed all over the body to draw off fever, which generally disappears within two hours of application.

Teucrium stocksianum Boiss. (Icon.: Rechinger et al., Fl. Iran. 150: 28, tab. 18–20, 1982).

VOUCHER SPECIMEN—AG & SMG 4975.

LOCALITY—Zeedi area.

VERNACULAR NAME—*kālpūrā*.

USES—As tonic, to treat jaundice (*kāwāl*), and to strengthen the heart.

TREATMENT—For all three purposes, about 100 to 125 g of aerial parts (fresh or dried) are coarsely ground and placed in $\frac{1}{2}$ glass of water for two or three hours. The liquid is then strained and drunk before breakfast. Generally, single daily doses are taken for two or three days.

COMMENTS—Burkill (1909, pp. 61–62) noted that near Quetta this plant is used to treat fever and in the Harboi Hills to relieve pain in the heart. In the Sarawan area it is used to treat malaria fever (Baluchistan District Gazetteer Series, 1907, vol. VI, p. 221).

VOUCHER SPECIMEN—AG & SMG 5051.

LOCALITY—Between Khuzdar and Nal.

VERNACULAR NAME—*hūssāin bootī*.

USES—To relieve skin irritation and itching, extreme thirst, and fever (including malaria).

TREATMENTS—For skin irritation, the aerial portions are burned to ash, mixed with a small amount of mustard oil, and then pulverized to a fine paste. This ointment is applied directly to the irritated area of the skin two or three times per day for three days.

For thirst, 15 to 20 g of plant parts are soaked in one glass of water overnight. In the morning the liquid is strained and drunk before breakfast. Treatment is taken whenever needed. The treatment for fever is similar but more frequent: two or three doses are taken per day until the symptoms disappear.

SOLANACEAE

Datura innoxia Miller (Icon.: Nasir, Fl. Pak. 168: 43, fig. 9A–D, 1985).

syn.: *Datura metel* non L.; *sensu* Clarke in Hook. f., Fl. Brit. Ind. 4: 243, 1883.

VOUCHER SPECIMEN—AG & SMG 4447.

LOCALITY—Awaran area.

VERNACULAR NAME—*dhātūrā*.

USES—As an intoxicant, to cause permanent madness, to poison people, and to treat tooth and gum disease (fig. 17).

TREATMENTS—Dried and crushed seeds and leaves are mixed with tobacco and smoked. A small quantity (one leaf) produces mild euphoria; larger quantities induce “madness.”

The plant is also used to poison people. The consumption of about 150 g of leaves, a fruit, or a flower is enough to cause death. The plant material is introduced into the food of the victim. Historically this technique was used in southern Balochistan to assassinate enemies.

Many Baloch maintain that the principal cause of gingivitis and tooth disease is worms living in the gums. One common treatment to get rid of these parasites is to burn six or seven seeds of this plant and expose the gums to the fumes. An alternative is to apply a paste made from the ash of burned seeds directly to the gums. In both cases the worms fall out of the gums.

COMMENTS—Although not verified, it appears that in some areas of southern Balochistan two other species, *D. stramonium* and *D. fastuosa*, are used in a similar fashion as *D. innoxia*. An infor-



FIG. 17. *Datura innoxia* growing out of rock levee on the outskirts of Khuzdar. Although the area was frequented by hundreds of domestic animals each day, this plant was hardly grazed. (Photo taken 8 May 1990 by S. M. Goodman.)

mant from the Mor Range mentioned that *D. innoxia* (AG & SMG 4911) is probably poisonous and is not used locally for any purpose. This species is of Asiatic origin and was introduced into Balochistan.

***Solanum incanum* L.** (Icon.: Nasir, Fl. Pak. 168: 16, fig. 3C-E, 1985).

VOUCHER SPECIMEN—AG & SMG 4572.

LOCALITY—Turbat area.

VERNACULAR NAME—*bātāg*.

USE—To treat gum disease.

TREATMENT—Ripe seeds are dried, crushed to a fine powder, and combined with goat fat. This mixture is placed on a flat stone, which is then heated over a fire. The resulting fumes are inhaled by the patient and also directed over the section of gums suspected of being infected with worms. Our informant mentioned that “[the worms] can immediately be seen falling out of the mouth.”

Two or three smoke treatments in a single day are usually sufficient to kill parasitic worms.

COMMENTS—Blatter et al. (1920, p. 229) remarked that the fruits are used in Balochistan as a horse medicine.

***Solanum nigrum* L.** (Icon.: Nasir, Fl. Pak. 168: 6, fig. 1A-D, 1985).

VOUCHER SPECIMENS—AG & SMG 4432 and 5204.

LOCALITIES—Awaran and Johan areas.

VERNACULAR NAMES—*tōl āngūr*, *mākōh* (U).

USES—To relieve indigestion and diarrhea in children up to 10 years old; also used as a coolant.

TREATMENTS—In the Awaran area the green parts are cooked as a vegetable and eaten. One small plate is usually enough to relieve stomach pain. When fresh material is not available, dried leaves can be soaked in water and used in the same way.

Near Johan the aerial portions are dried and

finely ground. The powder is warmed in a pan and spread across the abdomen of the patient. This draws heat from the body and relieves stomach disorder. One application is usually considered sufficient.

COMMENTS—Burkill (1909, p. 54) noted that near Loralai the fruits are eaten as food. Blatter et al. (1920, p. 229) mentioned its uses as a food plant and to treat stomach pain. *Solanum nigrum* contains solanine, a substance poisonous to humans (Duke, 1985).

Solanum surattense Burm. f. (Icon.: Nasir, Fl. Pak. 168: 10, fig. 2A–D, 1985).

syn.: *Solanum xanthocarpum* Schrad. & Wendl.

VOUCHER SPECIMEN—AG & SMG 4877.

LOCALITY—Bella area.

VERNACULAR NAMES—*bār chībkī*, *chībriāl vāl* (L).

USES—To facilitate healing of an infected fingertip or nail. Also used to kill parasitic worms in gums that cause tooth decay and gingivitis.

TREATMENTS—A ripe fruit is cut open and the infected fingertip is inserted into the pulp. A burning sensation indicates that the fruit juices are effectively drying up the infection. For gum and tooth parasites, a small piece of fruit is pushed into the infected area and “the worms fall out.”

COMMENTS—In northern Balochistan, near Bolan, children suffering from fever are washed in a decoction made from the leaves of this species; the plant is also important fodder for goats (Burkill, 1909, p. 54). Ethnobotanical uses of this plant in Pakistan are reviewed by Zaman and Khan (1970, p. 66).

VOUCHER SPECIMEN—AG & SMG 4953.

LOCALITY—Zeedi area.

VERNACULAR NAMES—*bhārēr*, *kāndēri*, *hāt chīptī* (Br).

USES—To induce vomiting, particularly in cases of serious food poisoning, to relieve constipation, and to facilitate the healing of infected wounds.

TREATMENTS—A green or ripe fruit is crushed and put into ½ glass of water. The liquid is stirred and immediately drunk. One dose is generally considered sufficient both to induce vomiting and to relieve constipation. The liquid is extremely sour, and at least for children it might be necessary to add a small amount of sugar.

Green fruits are broken open and the seeds and

pulp are applied directly to festering wounds. Two applications over the course of a single day are usually sufficient to rupture most infections and allow them to drain. The poultice produces a burning sensation when spread on the skin, followed by a cooling effect.

Solanum incanum L. (Icon.: Feinbrun-Dothan, Fl. Palaest. 3: 166, pl. 275, 1978).

syn.: *Solanum indicum sensu* Burkill, *auct. non* L.

VOUCHER SPECIMEN—AG & SMG 4835.

LOCALITY—Pasni area.

VERNACULAR NAME—*bhāēr*.

USE—To help heal infected fingers, toes, or nails.

TREATMENT—Whole ripe or unripe fruits are slightly heated in hot ash, then cut in half, and the injured digit is placed inside the pulp. As an alternative, the warm pulp is applied directly to the wound and covered by a bandage. These treatments cause festering sores to rupture and drain. Generally one application is sufficient.

COMMENTS—In the Baluchistan District Gazetteer Series (1907, vol. VI-B, pp. 234–235) it is mentioned that in the Wad area, the fruits of this plant are used for making cheese and the leaves are used as goat fodder. Burkill (1909, p. 54) also noted that in the Las Bella and Jhalawan areas the juice is used for making curds.

Withania somnifera (L.) Dunal (Icon.: Nasir, Fl. Pak. 168: 30, fig. 6A–E, 1985).

syn.: *Physalis somnifera* L.

VOUCHER SPECIMEN—AG & SMG 4400.

LOCALITY—Awaran area.

VERNACULAR NAMES—*kākīnk*, *rāsbhārī* (U).

USES—To help heal wounds or pimples. Also used as a coolant.

TREATMENT—The root bark of older plants is ground to a fine powder, mixed with water to form a paste, and applied directly to open sores and pimples. This poultice causes the wound to rupture and drain; healing follows quickly. It is also applied to the heels as a general coolant.

COMMENTS—Near Kalat, this plant is used to relieve boils and swellings on limbs; it causes the boils to ripen and burst (Burkill, 1909, p. 55). This

species may have been introduced into portions of Balochistan. The ethnobotanical uses of this plant in Pakistan are reviewed by Zaman and Khan (1970, pp. 73–74).

Withania coagulans (Stocks) Dunal (Icon.: Nasir, Fl. Pak. 168: 28, fig. 5E–J, 1985).

syn.: *Puneeria coagulans* Stocks.

VOUCHER SPECIMEN—AG & SMG 4453.

LOCALITY—Awaran area.

VERNACULAR NAME—*pānīrbād*.

USES—To relieve liver ailments, indigestion, constipation, and acute cough.

TREATMENTS—For liver disease, specifically when the liver or adjacent area of body is hot, 100 g of fruit are soaked in a glass of water overnight. The following morning the fruit is squashed in the glass, then the liquid is strained and drunk.

For indigestion, fruits and seeds are ground to a fine powder and a small handful is swallowed with water. Usually one dose is sufficient to relieve symptoms. To treat constipation, about 10 g of dried fruits and seeds are powdered and swallowed. This treatment is usually taken twice per day, but in extreme cases the frequency is increased to three or four times a day. Usually a single day of treatment is effective to relieve constipation.

To treat acute cough, fruits, seeds, and flowers are boiled together for ½ hour and the resulting liquid is distilled. The distillant is mixed with black salt (see Comments) and the seeds of fennel, radish, carrots, and turnips, then left to stand for ten days. The standard dose of this medicine is one teaspoonful twice per day until the symptoms disappear. This medicine can be stored for long periods of time, and many households are said to keep a supply of it on hand.

COMMENTS—Blatter et al. (1920, p. 230) noted that the leaves are used as an intoxicant. “Black salt” (*kālā nūn* [U, B], *kālā nimāk* [U, B]) is prepared by heating together common salt (sodium chloride), the fruits of *Terminalia chebula* (chebulic myrobalan) and *Phyllanthus emblica* (emblic myrobalan), and sodium carbonate (*sāji* [U]) until the ingredients fuse together (Watt, 1908, p. 56).

VOUCHER SPECIMEN—Not collected.

LOCALITY—Bella area.

VERNACULAR NAME—*pānīrbād*.

USES—To relieve upset stomach (*nāf*) and also as a rennet.

TREATMENT AND PROCEDURE—For stomach problems, three or four seeds are swallowed in the morning before breakfast daily for three or four days. Used whenever needed.

Two grams of powdered fruits and seeds are added to a glass of milk. Within 15 minutes the liquid curdles but does not become bitter. The curds are then used in the production of cheese. In Balochi the name *pānīrbād* means “milk curdler.”

COMMENTS—Burkill (1909, p. 54) listed the following uses of this plant in the Bella area: fruits—to treat colic, to curdle milk, and to remove hair from animal hides; smoke of seeds—to relieve gingivitis by killing worms in gums; and wood fibers—to clean teeth.

VOUCHER SPECIMEN—Not collected.

LOCALITY—Johan and Kalat area.

VERNACULAR NAMES—*pānīrbād*, *pārābānd* (local variant).

USES—To relieve constipation and to curdle milk.

TREATMENTS—Four to eight fruits are ground to a powder and then swallowed with water after the evening meal. Ten hours later (i.e., early the following morning), the patient passes a bowel movement.

Four to six fresh fruits (green or ripe) are squeezed into 1½ to 2 L of cow’s, sheep’s, or goat’s milk. This curdles the milk, and the curds are subsequently used to make cheese. If dried fruits are used they should be soaked in water until soft.

COMMENTS—In Sarawan, this plant is used “as a medicinal drug possessing cooling properties” (Baluchistan District Gazetteer Series, 1907, vol. VI, p. 133) and specifically to treat malaria (p. 221).

VOUCHER SPECIMEN—Not collected.

LOCALITY—Khuzdar area.

VERNACULAR NAME—*pānīrbād*.

USE—To relieve skin rash and small red pimples (*phūrrāī*). Used as a coolant.

TREATMENT—Ten grams of seed are ground and swallowed with water after breakfast and again after evening prayers. The seeds are rather bitter, and some people mix in a small amount of sugar. Treatment is generally continued for four to five days. It is believed that the cause of this disorder

is eating foods that create internal heat, such as fish, or prolonged exposure to the sun.

BIGNONIACEAE

Tecomella undulata (Roxb.) Seeman (Icon.: Nasir, Fl. W. Pak. 131: 5, fig. 2A–G, 1979).

syn.: *Bignonia undulata* Roxb.; *Tecoma undulata* (Roxb.) G. Don.

VOUCHER SPECIMEN—AG & SMG 4940.

LOCALITY—Between Bella and Wad.

VERNACULAR NAME—*pārdūk*.

USE—As a coolant.

TREATMENT—About 100 g of bark are boiled in 1 l of water. When $\frac{1}{2}$ of the liquid remains the decoction is strained, sweetened with a small amount of sugar, and stored out of the sun. The standard dose is two tablespoonsful of the decoction to be mixed in one glass of water and then drunk. Treatment is repeated two or three times per day for as long as needed.

COMMENTS—Burkill (1909, p. 57) noted that near Bella the leaves are an important fodder for goats and the bark is used to tan animal hides. Blatter et al. (1920, p. 233) remarked that a decoction of the flowers is used to treat “drieness of the liver and swollen belly.” This species was introduced into Balochistan.

OROBANCHACEAE

Cistanche tubulosa (Schrenk) Hook. f. (Icon.: Jafri, Fl. W. Pak. 98: 5, fig. 1F-1, 1976).

syn.: *Phelypaea tubulosa* Schrenk.

VOUCHER SPECIMEN—AG & SMG 4422.

LOCALITY—Awaran area.

VERNACULAR NAME—*lābbū*.

USE—Healing agent for pimples and small wounds.

TREATMENT—The plants used for medicinal purposes are those that die and dry in their natural growing position, and then turn black. At this stage they are collected and finely ground. A small quantity of the powder is sprinkled over the wound or pimple and the area is then bandaged. One application is usually sufficient.

Orobanche stocksii Boiss. (Icon.: Jafri, Fl. W. Pak. 98: 20, fig. 5A–G, 1976).

VOUCHER SPECIMEN—AG & SMG 5177.

LOCALITY—Johan area.

VERNACULAR NAMES—*māchēchūk*, *lābbū*.

USE—The basal portion of the stem is eaten raw as a vegetable. After the outer sheath is removed, the plant is ready for consumption.

ACANTHACEAE

Blepharis ciliaris (L.) B. L. Burt (Icon.: Malik & Ghafoor, Fl. Pak. 188: 5, fig. 1A–F, 1988).

syn.: *Ruellia ciliaris* L.

VOUCHER SPECIMENS—AG & SMG 4561 and 4976.

LOCALITIES—Turbat and Zeedi areas.

VERNACULAR NAME—*sāgēdāntān*.

USE—To heal festering wounds or large pimples.

TREATMENT—Dried ripe seeds are ground to a fine powder and mixed with a small amount of fresh cow's or goat's milk to form a thick paste, which is then spread directly on the infected area. This causes the infection to erupt quickly, drain, and heal. Generally the paste is applied two or three times per day for three or four days.

RUBIACEAE

Jaubertia aucheri Guill. (Icon.: Nazimuddin & Qaiser, Fl. Pak. 190: 98, fig. 24D–H, 1989).

syn.: *Gaillonia aucheri* (Guill.) Jaub. & Spach.

VOUCHER SPECIMEN—AG & SMG 4560.

LOCALITY—Turbat area.

VERNACULAR NAME—*tūssū*.

USE—Facilitates digestion of milk by newborn infants and acts as sedative.

TREATMENT—Thirty grams of leaves and flowers are boiled in one cup of water. When $\frac{1}{2}$ of the liquid remains, the decoction is strained and stored. A few drops, always less than $\frac{1}{2}$ teaspoonful, are given to the infant at various times throughout the day until the symptoms associated with the digestive problems pass. The light sedative nature of the decoction induces sleep.

COMMENTS—Burkill (1909, p. 37) noted that near

Kharan the leaves are burned and the smoke inhaled to treat sore throat and scurvy.

VOUCHER SPECIMEN—AG & SMG 4957.

LOCALITY—Zeedi area.

VERNACULAR NAME—*tüssā*.

USES—As a tonic for pregnant women to protect the fetus from diseases and to prevent spontaneous abortion. Also, to relieve heat rash in young children.

TREATMENTS—Ten grams of flowers and leaves are boiled in one cup of water. When $\frac{1}{2}$ of the liquid remains, the decoction is strained, cooled, and drunk. This dose should be taken two or three times per month, starting in the third month of pregnancy and continuing to childbirth. The same treatment in the same dosage also relieves skin rashes associated with pregnancy.

To treat heat or sweat rash in children, the plant is ground to a fine powder and dusted over the affected skin area. It is used whenever needed. It is particularly useful for rash around the anus and over the groin.

CUCURBITACEAE

Citrullus colocynthis (L.) Schrad. (Icon.: Nazimuddin & Naqui, Fl. Pak. 154: 12, fig. 31–M, 1984).

syn.: *Cucumis colocynthis* L.

VOUCHER SPECIMEN—AG & SMG 4409.

LOCALITY—Awaran area.

VERNACULAR NAMES—*kūlkūshṭā*, *handel* (A, F).

USES—A wide variety of medicinal purposes: as a purgative, to treat gum disease, to dry up pimples, as a vermifuge, to keep hair from falling out, to relieve pain associated with rheumatism, to treat leucorrhea, as a sexual stimulant in men, to activate the menstrual cycle, and to treat piles and inverted anus.

TREATMENTS—To relieve constipation, about six dried seeds are administered orally. One dose is almost always considered sufficient.

To rid the gums of parasitic worms that cause gingivitis and tooth decay, a paste is made from pulverized dried seeds and applied directly to the infected area. This expels the worms and relieves the problem.

To dry up pimples filled with pus, green fruits are cut into small fragments and applied directly

to the infected area. These pieces are left on for $\frac{1}{2}$ hour, then removed and set on the ground. The patient jumps over the fruits, and thereafter the pimples dry up quickly.

To purge the digestive system of tapeworms, green fruit pulp is dried out of direct sunlight and then crushed. The patient consumes about 30 g of powder, which kills the parasites. The treatment also induces diarrhea.

To stop hair from falling out of the head, the leaves are pressed and the juice is collected and applied directly to the scalp as a hair lotion.

For rheumatism (*rēhy bādī*), about 5 g of dried fruit pulp are swallowed with water in the morning and again in the evening each day. If a larger quantity is taken, it has purgative properties. Treatment is continued until the pain associated with rheumatism passes.

To relieve itching or leucorrhea of the vagina, a small piece of root, approximately 6–8 cm in length, is soaked in water until soft and then inserted in the vagina for one day. This same treatment also activates menstruation when the cycle is not regular.

For longer held and larger erections during sexual intercourse, the pulp of the green plant is rubbed on the heels of the man. It is crucial that the man's feet not touch the ground before he commences lovemaking.

To treat piles, a paste is made from powdered root mixed with water, then applied directly to hemorrhoids. This treatment relieves the pain and discomfort but does not actually dry up the piles.

To keep the sphincter of infants from inverting, a small amount of fresh root extract is applied directly to the anus. It is important to begin this treatment as soon as the problem is recognized or suspected.

COMMENTS—Our informant mentioned that the greens are poisonous when eaten by people. Goats sometimes browse the plant, but neither gazelles (*Gazella gazella*) nor markhor (*Capra hircus*) feed on it. However, this information is in conflict with Burkill's (1909, p. 33) comment that near Bella it is "considered a fodder for goats, camels and deer." At various places throughout Balochistan, this plant is used as a purgative (Burkill, 1909, p. 33). Zaman and Khan (1970, pp. 27–28) review the ethnobotanical use of this plant in Pakistan.

VOUCHER SPECIMEN—Not collected.

LOCALITY—Zeedi area.

VERNACULAR NAME—*hārīngrī*.

USES—To relieve constipation and joint pain. Also used as a flour substitute.

TREATMENTS—The pulp is removed from half of a ripe yellow fruit and milk is poured into the hollow half. This is left overnight, and in the morning the contents are drunk. It usually takes about ½ hour for the constipation to pass.

For pain of the joints, green fruits are cut into slices or wedges and placed in a large basin. The patient then steps into the basin with bare feet and tramples over the fruits. Within minutes the patient can taste the bitterness of the seeds, and the pain is relieved. The symptoms of this ailment seem to be related to arthritic or rheumatic pain.

In times of famine, the seeds are used as a grain supplement. Dried ripe seeds are cracked and the endosperm removed, slightly fried, ground, and then mixed with milled wheat grain in a proportion never exceeding 10% *Colocynthis* flour.

COMMENTS—In the Kharan area the seeds of “*kulkush*” are used as a famine food—the seeds are soaked for two weeks, with the water changed each day, then they are dried, ground, and mixed with flour (Baluchistan District Gazetteer Series, vol. VII-A, pp. 126–127).

VOUCHER SPECIMEN—Not collected.

LOCALITY—Between Khuzdar and Nal.

VERNACULAR NAME—*hāringrī*.

USE—To relieve constipation.

TREATMENT—Whole seeds from ripe fruits are placed in a bucket of water for 24 hours. They are then removed, rinsed, dried, crushed, and husked. Three or four endosperms are mixed with a small amount of sugar and taken orally. One dose is generally considered sufficient. More than six seeds at a time causes extreme diarrhea.

VOUCHER SPECIMEN—Not collected.

LOCALITY—Pasni area.

VERNACULAR NAME—*gwōnj*.

USES—As a purgative, as a vermifuge, to relieve stomachache, and as a famine food.

TREATMENTS—For the first three uses listed the same preparation is employed. The pulp of ripe fruits is removed and dried. About 5 g are taken once per day, often with a small amount of candied sugar (*misri*). For some people this quantity induces diarrhea; for others the effect is not as drastic. The seeds are not used in any of these preparations because they are not considered to have any medicinal value. Our informant mentioned that the described treatment is seldom used today

and that instead, people suffering from these disorders rely more on allopathic medicines.

To supplement grain reserves in times of low food availability, the seeds are removed from ripe fruits, washed three or four times in water, and dried. They are then ground to a fine powder and mixed with wheat flour in a ratio of 1:3, respectively. When used in this quantity for a period of time, the flour sometimes induces slight diarrhea.

VOUCHER SPECIMEN—Not collected.

LOCALITY—Mor Range.

VERNACULAR NAME—*timmāh* (L).

USE—To relieve pain in the joints, particularly the hands and feet. Has general coolant properties.

TREATMENT—Ripe fruits are sliced into small pieces and kept for seven days in a large earthenware pot filled with water. After this period, the limb with pain is soaked in the liquid for about one hour. A single application is usually considered sufficient to relieve the pain. On the basis of the symptoms described by the informant, the disorder appears to be arthritic or rheumatic in nature.

COMPOSITAE

Achillea wilhelmsii C. Koch (Icon.: Huber-Morath, Fl. Iran. 158: 53, tab. 54, 1986).

syn.: *Achillea santolina sensu* Burkill *et aucts.*, non L.

VOUCHER SPECIMEN—AG & SMG 5129.

LOCALITY—Between Nichara and Kalat.

VERNACULAR NAME—*bōī mādrān*.

USE—To relieve stomach pain.

TREATMENT—A handful of aerial parts are cut into small pieces, placed in a glass of cold water for 24 to 48 hours, strained, and drunk. The extract can be made in bulk and stored in bottles for extended periods. The dose for mild cases is one glass per day, for severe cases, two glasses per day, and for acute cases, three glasses per day. Treatment should be continued until symptoms pass.

COMMENTS—Burkill (1909, pp. 39–40) noted that this species is used in Balochistan to relieve stomach pain in children.

Acroptilon repens (L.) DC. (Icon.: Rechinger et al., Fl. Iran. 139b: 308, tab. 298, 1980).

syns.: *Centaurea repens* L.; *Centaurea picris* Pall.

VOUCHER SPECIMEN—AG & SMG 4969.

LOCALITY—Zeedi area.

VERNACULAR NAME—*tālkhā*.

USE—To relieve malarial fever; as a coolant.

TREATMENT—Approximately 100 g of aerial parts (fresh or dry) are crushed and boiled in one glass of water. When $\frac{1}{2}$ of the liquid remains the decoction is strained, cooled, and drunk. The standard dosage is $\frac{1}{2}$ glass in the morning and another in the evening for two or three days.

COMMENTS—Near Wad this plant is used as a vermifuge, and in the Harboi Hills it is used to help heal the skin wounds of sheep (Burkill, 1909, p. 42).

VOUCHER SPECIMEN—AG & SMG 5024.

LOCALITY—Between Khuzdar and Nal.

VERNACULAR NAME—*tālkhā*.

USE—To relieve stomachache.

TREATMENT—Between 15 and 20 g of aerial parts are boiled in one cup of water. When $\frac{3}{4}$ of the liquid remains it is strained, cooled, and drunk. Treatment is generally taken once per day, before breakfast, for two or three days.

A second method is to crush and boil about 20 g of root in two glasses of water. When $\frac{1}{2}$ of the liquid is left, the decoction is strained and divided into three or four equal parts. These portions are taken at evenly spaced intervals over the course of a single day.

Artemisia turanica Krasch. (Icon.: Podlech, Fl. Iran. 158: 199, tab. 188 & 220, fig. 13, 1986).

syn.: *Artemisia lamprocaulos* Rech. f.

VOUCHER SPECIMEN—AG & SMG 5235.

LOCALITY—Kalat area.

VERNACULAR NAME—*sūrkh jīr*.

USES—To relieve various types of fever and skin rash associated with extreme heat. Also, to relieve stomach pain in children younger than seven years.

TREATMENTS—Between 50 and 100 g of dried or fresh plant material are boiled in $\frac{1}{2}$ L of water, and when $\frac{1}{4}$ L remains the decoction is strained and stored. The standard dose is $\frac{3}{4}$ cup of the decoction, drunk twice per day after food, in the morning and evening for three days. This is generally considered sufficient to control most types of fever.

For skin rash or an outbreak of small reddish

pimples, $\frac{1}{2}$ kg of aerial parts is put into a bucket of water overnight. In the morning the liquid is strained and used as bathwater. This procedure is repeated for three days.

For treating stomach pain in children, the herb is ground into a fine powder, then mixed with a small amount of water and mustard oil until it becomes a thick paste. The ointment is spread across the skin of the stomach area, where it is left for 12 hours. One application is considered sufficient.

Hertia intermedia (Boiss.) O. Ktze. (Icon.: Dittrich et al., Fl. Iran. 164: 97, tab. 65, 1989).

syn.: *Othonnopsis intermedia* Boiss.

VOUCHER SPECIMEN—AG & SMG 5220.

LOCALITY—Kalat area.

VERNACULAR NAMES—*mōngūlī*, *mūnglī*.

USE—As an insect repellent, particularly for ectoparasites such as bedbugs (*mangur*).

PROCEDURE—Dried plant material is burned on hot coals and the smoke is allowed to permeate the infected area or article (e.g., the house or bedding).

COMMENTS—In northern portions of Balochistan this plant is used to relieve headaches and to treat boils and pimples (Burkill, 1909, p. 40). Blatter et al. (1919, p. 173) noted that the leaves are ground into a paste, which is mixed with oil, spread on a *chipati* (flat bread), and pressed against the forehead of a person suffering from a cold or fever.

Inula grantioides Boiss. (Icon.: Georgiadou et al., Fl. Iran. 145: 95, tab. 72, 73, 1980).

VOUCHER SPECIMEN—AG & SMG 4916.

LOCALITY—Mor Range.

VERNACULAR NAME—*nārō* (L).

USE—To help heal lacerations and festering wounds.

TREATMENT—Fresh leaves are crushed and the resulting paste is applied directly to fresh or infected wounds and then bandaged. The paste should be used every other day. Within five days the wound is nearly or completely healed.

COMMENTS—Burkill (1909, p. 39) noted that near Bella this plant is used as camel fodder, clothes soap, and steeped in water as treatment for asthma.

Launaea capitata (Spreng.) Dandy (Icon.: Rechinger et al., Fl. Iran. 122: 146, tab. 104, 1977).

syns.: *Sonchus capitatus* Spreng.; *Launaea glomerata* (Cass.) Hook. f.

VOUCHER SPECIMEN—AG & SMG 4573.

LOCALITY—Turbat area.

VERNACULAR NAME—*ālākū*.

USE—To relieve milk digestion and urinary tract problems in infants up to three weeks old.

TREATMENT—The green portions are boiled in water for about one hour and the resulting decoction is strained and bottled for long-term storage. One or two teaspoonfuls should be given to the infant three or four times per day, but only after nursing. The leaves are considered to be the most effective portion of the plant, in which case 10 g of fresh material are added for every cup of water used in the preboiling liquid.

COMMENTS—In northern Balochistan the leaves are eaten as a vegetable, and a decoction made from plant parts is used to treat headache (Burkill, 1909, p. 44).

Launaea nudicaulis (L.) Hook. f. (Icon.: Rechinger et al., Fl. Iran. 122: 156, tab. 113, 1977).

syn.: *Chondrilla nudicaulis* L.

VOUCHER SPECIMENS—AG & SMG 4796 and 4816.

LOCALITY—Pasni area.

VERNACULAR NAME—*ālākū*.

USE—Leaves are eaten raw as a vegetable.

COMMENTS—Burkill (1909, p. 44) described this plant as important fodder for domestic animals throughout southern Balochistan. He also mentioned that near Bella the leaves are applied to the heads of children to relieve headache.

Launaea remotiflora (DC.) Amin & Rech. f. (Icon.: Rechinger et al., Fl. Iran. 122: 148, tab. 105, 1977).

syns.: *Lactuca remotiflora* DC.; *Zollikoferia stocksiana* Boiss.

VOUCHER SPECIMEN—AG & SMG 5038.

LOCALITY—Between Khuzdar and Nal.

VERNACULAR NAME—*shāmāhūr*.

USE—To clear chest congestion, particularly when phlegm is mixed with blood.

TREATMENT—About 100 g of plant parts are boiled in two glasses of water. When $\frac{1}{2}$ of the liquid remains it is strained and sweetened with *pātāshā* (candied sugar). The normal dose is $\frac{1}{2}$ glass in the morning and $\frac{1}{2}$ glass again in the evening. These symptoms are caused by severe cold or by internal injury due to heavy physical strain.

Microcephala lamellata (Bunge) Pobed. (Icon.: Podlech, Fl. Iran. 158: 83, tab. 81, 1986).

syns.: *Matricaria lamellata* Bunge; *Matricaria lasiocarpa* Boiss.

VOUCHER SPECIMEN—AG & SMG 5230.

LOCALITY—Kalat area.

VERNACULAR NAMES—*pīmplī*, *bābūnā* (U).

USE—To relieve fever, particularly typhoid.

TREATMENT—About 100 g of dried leaves and flowers are placed in two cups of water overnight, and the following morning the mixture is strained. The standard dose is one cup drunk in the morning before breakfast and a second cup drunk in the evening after dinner. This procedure is followed for two or three days.

Pluchea arguta Boiss. (Icon.: Jafri, Fl. Karachi, 335, fig. 327, 1966; Georgiadou et al., Fl. Iran. 145: 8, tab. 4, 1980).

VOUCHER SPECIMEN—AG & SMG 4595.

LOCALITY—Turbat area.

VERNACULAR NAME—*mājūsār*.

USES—To treat urinary tract diseases, dissolve kidney stones, and stimulate urination.

TREATMENT—Between 25 and 30 g of dried aerial parts are ground to powder, mixed with one cup of water, and stirred. After 10 to 15 minutes the infusion is strained and drunk. This dose is given once in the morning and again in the evening until the symptoms are relieved. This procedure is used for all of the above ailments. Kidney stones generally dissolve or pass out of the urinary tract within one week.

Pulicaria undulata (L.) C. A. Mey. (Icon.: Georgiadou et al., Fl. Iran. 145: 120, tabs. 98, 99, 1980 sub. *P. crispa*).

syns.: *Inula undulata* L.; *Francoeuria undulata* (L.) Lack.

VOUCHER SPECIMEN—AG & SMG 4964.

LOCALITY—Zeedi area.

VERNACULAR NAMES—*rāmbāvā*, *rāmbō* (Br).

USE—To relieve nasal and bronchial congestion associated with the common cold.

TREATMENT—Between 100 and 250 g of aerial parts are placed in a pot of boiling water and the resulting vapors are inhaled by the patient. This procedure is repeated twice per day for one or two days.

COMMENTS—Blatter et al. (1919, p. 172) noted that a decoction is “given to children in whose stomach milk turns sour.”

***Pulicaria glaucescens* Jaub. & Spach**

syns.: *Pterocheate glaucescens* Boiss.; *Platychaete glaucescens* (Boiss.) Boiss.

VOUCHER SPECIMEN—AG & SMG 4818.

LOCALITY—Pasni area.

VERNACULAR NAME—*kūlmeer*.

USE—For postparturition care in women.

TREATMENT—A composite medicine is made from 500 g of dried aerial portions of this plant, 300 g of *izgīnd* (*Zataria multiflora*, see p. 67) plant parts, and 300 g of *īshrēk* (*Rhazya stricta*, see p. 35) leaves. All are boiled together in 4 L of water. When ½ of the liquid remains it is strained, and ½ kg of brown sugar (*gur*) is added. The mixture is then slowly heated until it solidifies. Balls about the size of a small lemon are rolled out of the mixture. Each ball is tied to a 10–20 cm length of string and then wrapped in gauze. One ball is inserted into the vagina, as far up into the womb as possible, with the string end remaining outside of the body. After two or three days the gauze remains are removed from the vagina. This treatment, known as *chellagi*, is given to women after childbirth to cleanse the womb and also in cases of postparturition discomfort, infection, or irregular menstrual cycle.

***Scorzonera tunicata* Rech. f. & Koeie** (Icon.: Re-chinger et al., Fl. Iran. 122: 35, tab. 16, 1977).

VOUCHER SPECIMEN—AG & SMG 5121.

LOCALITY—Kalat area.

VERNACULAR NAME—*dāghām*.

USE—Leaves and roots eaten raw as a vegetable.

COMMENTS—In the Harboi Hills, the roots of this plant are eaten in the spring as a vegetable (Baluchistan District Gazetteer Series, 1907, vol. VI-B, pp. 236–237).

Part 2. The Pharmacopoeia of Balochistan Herbalists

Brief Summary of the Unani and Ayurvedic Systems of Medicine

The term Unani is derived from the Arabic *Tibb-i-Yunani*, meaning “Greek medicine.” The origin of the Unani tradition is deeply rooted in Greek and Arab medical history, with many of the principles and philosophical points expressed by the early physicians of these two cultures reflected in modern Unani practices. For example, the ancient Greek Galen (131–201 A.D.) was a medical practitioner and experimented with a battery of drugs derived from plants. He devised an elaborate system of single plant remedies, a direct parallel to the Unani concept of “singles” (see p. 50). Galen’s use of therapeutics was based on treatment with plant-derived drugs to balance or overcome the elementary qualities of heat, cold, moisture, and dryness (Garrison, 1929; Said, 1970). Many of Galen’s writings were translated into Arabic, and they had a profound influence on the development of Unani medical and treatment practices (Hamarneh, 1973).

Sheikh Bu Ali Sina, also known as Avicenna, who lived from 980 to 1037 A.D., was a physician in Baghdad and the author of many works, generally written in Arabic, on medicine. He is known to Unani practitioners as *el-Sheikh-Ra’is*, meaning “chief master,” in recognition of his important contribution to the field (Browne, 1921). One of his books, *Qanun* (meaning “canon” or “law” in Arabic), is an amalgamation of contemporary eleventh-century ideas in the disciplines of philosophy and medicine and those of Galen, dating from the second century A.D. (Said, 1970). It was during this period that Unani practices emerged out of the evolving Greco-Arab medical tradition.

The Unani system is still widely practiced in Pakistan. Currently there are 40,000 Unani *hukmā* and 700 dispensaries registered with the National

Council for Tibb in Pakistan (Mohammad Din Khan, pers. comm.). In India, as of 1981 there were 28,380 licensed Unani practitioners and 870 dispensaries (Satyavati, 1990). Detailed Unani *materia medica* have been published, for example by Said (1970) and Rahman et al. (1986).

The origin of Ayurvedic medicine can be traced to the Rigveda, which is perhaps one of the oldest books in existence, having been written between 4500 and 1500 B.C. In the Rigveda the effects of plant extracts on people are mentioned, particularly in the context of amulets and charms and the concept of prevention. The Ayurveda, written between 2500 and 600 B.C., forms the traditional basis for subsequent developments in the Ayurvedic medical system of the Indian subcontinent. Specific sections of this treatise deal with therapeutics, surgery, purgatives, emetics, simple drugs, and methods of administration (Chopra, 1958).

Ayurveda is not simply a medical system but rather a physical and philosophical approach to life. It considers humans as a microcosm of the universe, and that all of the associated properties found in the natural world are present in humans. Conversely, the aspects found in the human being are also reflected in the universe: "Man is therefore a microcosm in a macrocosm" (Sofowora, 1982, p. 14). In accordance with this philosophy the universe consists of four basic elements—earth, water, fire, and air, and these same factors constitute the human body. A healthy person is one in whom these elements are properly aligned, in the sense of mind, body, and soul. Any deviation from this balance results in psychological, physical, and spiritual ailments.

This system is still widely practiced in India and to a lesser extent in Pakistan. As of 1984 over 251,000 practitioners and 12,000 dispensaries in India were registered to practice Ayurvedic medicine (Satyavati, 1990). Also, detailed Ayurvedic *materia medica* have been published (e.g., Nadkarni, [1954]; Chopra, 1958; Kirtikar, 1975).

The Various Types of Herbalists and Herbal Doctors

Throughout Pakistan, including Balochistan, there is a wide variety of people selling herbs, prescribing drugs, and diagnosing disease. In many towns, villages, and cities, street vendors sell fresh plants and, to a lesser extent, dried material with

medicinal value. These vendors do not prescribe drugs but rather fill requests of customers, who know exactly what they want. This type of herbalist (*pānsār* singular, *pānsāryōn* plural) has been called "pavement pharmacist" or "open-air pharmacist" (Haque et al., 1984).

In many places there are street vendors who move through the community hailing customers and selling medicines. Often such vendors stock mostly dried material and little in the way of fresh plants. They prescribe and dispense drugs derived from a single plant, called "simples" or *mūfrādāth* in the Unani medical tradition. Generally the medicine is prepared for the customer during the transaction, which often involves grinding and sieving the plant material. Physicians of this kind are not always mobile, but rather they might have a stall in the bazaar. These vendors are also referred to as "pavement pharmacists."

In many of the larger villages there are small shops that sell calcined preparations; these shops are often referred to as "cabin pharmacies" (Haque & Mahdihassan, 1984). The shop physicians diagnose and prescribe remedies to cure various types of ailments and disease. Many of the preparations are made of calcine metals and minerals (*kūshṭās*), making the physician more of pharmacist-alchemist than herbalist as in the case of the *pānsār*. The *kūshṭās* are often based on traditional Ayurvedic medicine rather than Unani.

In another group is the true *hākīm* (*hūkmā*, plural), or traditional physician. *Hūkmā* call upon a vast written and learned tradition in the use of medicinal plants and calcine drugs in their clinical practice. They may refer to published pharmacopoeia in determining the appropriate medicine to prepare and dispense. These medicines may be either "simples" or "compounds" (*mūrākkābāt*) and generally are based on Unani traditions. Considerable training, experience, and skill form the basis of diagnosis; for example, aspects might include knowing the patient through a physical or visual insight such as pulse diagnosis or extrasensory perception. The *hākīm* also dispenses prepared medicines for general ailments. Many of these medicines are patented and are available through a variety of outlets.

Interviews with Some Herbalists

Mohammad Shoaib was born in 1968 in Turbat, where he has always resided. His first language is

the Makrani dialect of Balochi. He is a Muslim. His formal education was to level six, after which time he joined his father's herbal store. This extra help in the shop allowed the father to expand his services and devote time to his practice as a *hākīm*. The father moved his practice to the pavement outside of the herbal store. Most of Mohammad Shoaib's knowledge comes from his father or from discussing the medicinal uses of various plants with the people who gather the plants and bring them to the shop for wholesale, or with the patrons themselves. The shop also carries a variety of other items, including patented Unani medicines, miscellaneous plant condiments, and perfumes. He has had little chance to travel outside the immediate area of Turbat.

Naraindas was born in 1940 in Khuzdar, where his family has lived for seven generations. He is a Hindu. His father was a true *hākīm*, but Naraindas and his brother Lal Chand have not carried on this tradition, and they consider themselves herbalists. Naraindas did not gain much of his knowledge about herbal medicine from his father; rather, as a young man, when delivering remedies to his father's customers, he would ask them about their use. His shop in Khuzdar sells a variety of patented Unani medicines, herbal medicines, building supplies, cutlery, and cookery. People regularly come to the shop already knowing which plants and in what combinations they want, although some of the patrons (both men and women) describe their symptoms to Naraindas or Lal Chand, who then diagnose the disorder and prescribe and dispense an herbal remedy. Naraindas is strongly encouraging his sons to learn the trade and is sure that at least one of them will carry on the business.

A Kalat *pānsār*, Hotchand Menghraj Pansari was born in approximately 1934 and is a practicing Hindu. His shop sells a variety of patented medicines and tonics, and has a large variety of medicinal plants. He also exports medicinal herbs to wholesalers and *dāwākhānās* (Unani dispensaries or, in the modern sense, Unani pharmaceutical firms) in Lahore and Karachi. The vast majority of people coming into the shop know exactly what they want. Although Hotchand has no formal training as an herbalist, through the years he has built up considerable familiarity with Unani medicine by reading published texts and exchanging information with customers and other herbalists. He regularly consults reference works when trying to determine appropriate herbal treatments for

customers (e.g., Abdullah, n.d.; Kabiruddin, 1982; Awan, 1986; Sanyasi, n.d.).

One of the larger *pānsāri* shops in Gwadar is owned and run by Mohammad Hasham Nagwan, who was born in Gwadar in the mid-1930s. He is an Ismaili, a follower of the Agha Khan. The shop was formerly owned by a famous Hindu *hākīm* by the name of Khuro Mal. In 1947, after the partition of India and Pakistan, Khuro Mal left for India and Nagwan took over the shop. This shop is famous in southern Balochistan and is known by the previous owner's name, "Khuro's shop." Nagwan started working at the store at the age of 15 and learned a considerable amount about medicinal plants from the *hākīm*. The shop now sells a wide variety of medicinal plants and, to a much lesser extent, patented Unani medicines. Nagwan has traveled widely in Oman, the United Arab Emirates, and Bahrain, and speaks Balochi and Urdu.

Methodology

PROCEDURE FOR INTERVIEWS—Our principal way of gathering information from *pānsāryōn* and *hākīmā* was through direct interviews in their shops. The conversations were generally held in Urdu. Our usual procedure was to explain the purpose of the project, who we were and our institutional affiliations, and what other villages we had visited in Balochistan, all the while allowing the potential informant a chance to ask us questions. Often the first and second visits were simply to build rapport and allow the *pānsār* or *hākīm* to feel comfortable with us. On subsequent visits we would interview the informant about the plants sold in the shop and their specific uses (Croom, 1983). These sessions lasted from 20 minutes to six hours. Throughout these interviews customers would often be visiting the shop to buy herbal medicines and other goods. This gave us the opportunity to watch the interaction between herbalist and customer and to ask questions about specific plants.

SAMPLE COLLECTION AND IDENTIFICATION—In most cases we purchased a specimen of each sample discussed with a *pansar* or *hakim*. Field numbers from the catalogue of AG & SMG (Abdul Ghafoor & Steven M. Goodman) were given to these samples; they have been treated as standard botanical voucher specimens. Samples were not purchased when we were certain that the material for sale had already been obtained from another

herbalist. The first set of specimens is deposited in the Karachi University Herbarium (KUH), University of Karachi, and the second set in the Department of Botany, Field Museum of Natural History (F).

Several plant samples were easily identified to species, although many that were composed only of seeds, flowers, or foliage were identified after critical comparison with herbarium specimens. Several materials were determined to be minerals. Others, mostly gums and resins, still remain unidentified; these are presented at the end of the Systematic List.

Transliteration of vernacular names follows the same system used in Part 1 (see p. 9). The names cited in this section are those mentioned by our contact in each shop. Under the heading "Source" is listed the region or regions mentioned by the shopkeeper as the place where the material under discussion was collected or grown. In the majority of cases the herbalists buy the plants directly from the gatherer or grower, although a few herbalists purchase material from Karachi wholesalers, and some of that material originally comes from southern Balochistan. We have also listed the price of each plant in a given bazaar. The price is the unit cost given by the respective shopkeeper and is presented in Pakistani rupees. This information is cited to allow assessment of the relative value in monetary terms of the various plants discussed. As of 1 February 1990 the exchange rate was 21.40 rupees per \$1.00 (U.S.).

Systematic List

Plants

EPHEDRACEAE

Ephedra intermedia Schrenk & Meyer (Icon.: Nasir & Nasir, Fl. Pak. 186: 31, fig. 6F-1, 1987).

VOUCHER SPECIMEN—AG & SMG 4888.

LOCALITY—Bella bazaar.

VERNACULAR NAME—*nārom*.

USE—For relief of backache.

Treatment—About 25 g of stems are ground and boiled in one cup of water. When $\frac{1}{2}$ of the liquid remains, the decoction is strained, cooled, and drunk. This dose is taken twice per day, once in the morning and again in the evening, for three days or until pain ceases. The same preparation

and dosage are used by some people as a general tonic.

SOURCE—Khuzdar area.

PRICE—16 rupees/kg.

CUPRESSACEAE

Juniperus excelsa M. Bieb. (Icon.: Nasir & Nasir, Fl. Pak. 184: 20, fig. 4C-D, 1987).

VOUCHER SPECIMEN—AG & SMG 4532.

LOCALITY—Turbat bazaar.

VERNACULAR NAME—*āpūrs*.

USE—To treat measles in children.

Treatment—About 30 g (= 20 to 25 fruits) of whole fruit are boiled in one glass of water until $\frac{1}{4}$ of the liquid remains. The decoction is then strained, partially cooled, and drunk by the patient; the pimples associated with the measles quickly dry up.

SOURCE—Mountains near Kalat.

PRICE—20 rupees/kg.

COMMENTS—Turchetta (1989) reported that the resin of this plant is sold in the Quetta bazaar and is used to thwart spirits and treat insect bites.

IRIDACEAE

Crocus sativus L. (Icon.: Fiori, Ic. Fl. Ital. 1: 95, fig. 757, 1933).

VOUCHER SPECIMEN—AG & SMG 5247.

LOCALITY—Khuzdar bazaar.

VERNACULAR NAME—*plām phool*.

USE—To relieve dysentery.

Treatment—About 10 g of ground flower parts are mixed with 250 g of milk curd and administered orally in the morning and again in the evening. The treatment period for children is one day, and for adults, three days. If symptoms persist, a second round of medicine is administered.

In the Kalat bazaar we found *Crocus* sp. bulbs for sale; they are locally called *khākhōbē*. This plant is an introduced cultivar in the immediate area but apparently is not used by local people. The bulbs are exported to the bazaars of large cities such as Karachi.

SOURCE—Cultivated in Kalat and Khuzdar area.

PRICE—100 rupees/kg.

CRUCIFERAE

Sisymbrium loeselii L. (Icon.: Jafri, Fl. W. Pak. 55: 251, fig. 33C-E, 1973).

VOUCHER SPECIMEN—AG & SMG 5005.
LOCALITY—Khuzdar bazaar.
VERNACULAR NAMES—*roosh*, *khākshēēr* (U).
USES—For the treatment of dysentery and typhoid fever.

TREATMENTS—About 10 g of seeds are ground, combined with a small amount of sugar, and mixed in one glass of water. Generally this dose is taken twice per day, in the morning and evening, for three days. The treatment is used for all “types” of dysentery.

For typhoid fever, about 5 g of seed are mixed with a handful of large raisins and heated in ½ cup of water to near boiling. The decoction is then strained, slightly cooled, and drunk. This dose is normally taken twice per day, in the morning and evening, for two or three days.

SOURCE—Not known.
PRICE—20 rupees/kg.
COMMENTS—Turchetta (1989) mentioned that in the Quetta area the seeds of a *Sisymbrium* sp. are sold in the bazaar and used to quench thirst.

CAESALPINIACEAE

Cassia italica (Mill.) F. W. Andr. (Icon.: Rechinger, Fl. Iran. 160: 3, tab. 2, 1986).

syn.: *Cassia obovata* Collad.

VOUCHER SPECIMEN—AG & SMG 4544.
LOCALITY—Turbat bazaar.
VERNACULAR NAME—*kāspīnd*.

USES—As a coolant, and to get rid of dandruff.
TREATMENTS—The fruits are ground into a paste, sometimes with a small amount of *Lawsonia inermis* (*hēnnā*, see p. 58), and then applied to the heels for a cooling effect. The paste is also spread on the scalp to relieve itching and flaking of the skin. The same procedure and uses were also described by an informant in the Pasni bazaar.

SOURCE—Areas near Dasht and Suntsar.
PRICE—40 rupees/kg.
COMMENTS—In the Quetta area the leaves of this plant are mixed with an infusion of rose petals to treat constipation (Turchetta, 1989).

VOUCHER SPECIMEN—AG & SMG 4759.
LOCALITY—Gwadar bazaar.
VERNACULAR NAME—*kāspīnd*.
USE—To relieve headache.

TREATMENT—The fruits are ground and mixed with water to form a paste. This poultice is applied to the temples for several hours and then washed off. Some people add a small amount of *Lawsonia inermis* (*hēnnā*, see p. 58) to the mixture.

SOURCE—Hills north of Turbat.
PRICE—20 rupees/kg.

Cassia senna L. (Icon.: Ali, Fl. W. Pak. 54: 12, fig. 2C-E, 1973).

syn. *Cassia angustifolia* Vahl.

VOUCHER SPECIMEN—AG & SMG 4887.
LOCALITY—Bella bazaar.
VERNACULAR NAME—*sōnā* (L).

USE—To relieve stomach gas and indigestion.
TREATMENT—About 25 g of leaves and stems are boiled in one glass of water. When ½ the liquid remains the decoction is strained and drunk. Generally a single dose is considered sufficient. This herbal preparation is also used to relieve excess stomach gas in domestic animals; for cattle, 125 g are used, and for goats and sheep, 75 g.

SOURCE—After rains, common in the mountains near Khuzdar.
PRICE—20 rupees/kg.

COMMENTS—In the Kachhi area a purgative made from this plant is used to treat fever (Baluchistan District Gazetteer Series, 1907, vol. VI-A, p. 185).

MIMOSACEAE

Acacia nilotica (L.) Delile (Icon.: Rechinger, Fl. Iran. 161: 4, tabs. 5, 6, 1986).

syn.: *Mimosa nilotica* L.

VOUCHER SPECIMENS—AG & SMG 4881 and 4892.
LOCALITY—Bella bazaar.
VERNACULAR NAMES—*bābār kā chōdā* (L), *bābār kā chāmrā* (L).

USES—Ingredient in the preparation of wine, and to tan animal hides.
PROCEDURES—About ½ kg of bark is mixed with

3 kg of five- or six-year-old brown sugar (*gur*) and 10 L of water and then left in a closed container in the direct sun. After 10 days the cap is removed from the vessel, and if the contents smell of alcohol the "wine" is ready. If not, it is left in the container for three or four more days. The "wine" is then strained and distilled. Our informant mentioned that the resulting spirit is so strong that when a small amount is placed on the floor and lit with a match, "the flame jumps to the ceiling."

A second reported use of this plant is for tanning animal hides for use as water sacks (*māshk*). Approximately ¼ rice sack of bark is crushed into small pieces and then boiled in a large pot of water. The resulting decoction is strained and stored. The whole animal skin is filled with the tanning fluid for 10 to 15 days or until the skin feels soft and pliable, at which time the liquid is poured off and the skin is ready to be used. Two or three days into the tanning process, the animal's hair falls off the skin. The liquid can be stored and reused for periods of up to six months.

SOURCE—Throughout the Bella area.

PRICE—Not recorded.

PAPILIONACEAE

Glycyrrhiza glabra L. (Icon.: Sastri, Wealth Ind. 4: 151, fig. 70, 1956).

VOUCHER SPECIMEN—AG & SMG 5252.

LOCALITY—Kalat bazaar.

VERNACULAR NAME—*khāwāsdār*.

USES—As a cough suppressant, to clear mucus in throat, to relieve throat dryness, and as a tonic during extreme heat.

TREATMENTS—For all of these purposes the same procedure is followed: the bark of the root is shaved off and the woody section chewed until it falls into small pieces and the taste is gone. A small portion of the root should be chewed two or three times per day until symptoms disappear. Our informant mentioned that snakes are attracted to the plant and that by rubbing against it they may spread their poison. Thus, it is extremely important to remove the bark of the root before it is chewed.

SOURCE—In the not too distant past this plant was common in the wild throughout Balochistan, but due to over-exploitation it is now rare. Currently the best place to find wild populations is between Kalat and Nushki.

PRICE—Not recorded.

COMMENTS—Zaman and Khan (1970, pp. 41–

42) describe the ethnobotanical uses of this plant in Pakistan. Blatter et al. (1919, p. 134) mentioned that in Balochistan it is "mixed with other drugs for derangements of the blood."

ZYGOPHYLLACEAE

Fagonia glutinosa Delile (Icon.: El-Hadidi, Fl. Iran. 98: 3, tab. 2, 1972).

VOUCHER SPECIMEN—AG & SMG 5248.

LOCALITY—Khuzdar bazaar.

VERNACULAR NAME—*kārkāwāg*.

USE—As a coolant to relieve fever and "summer rash."

TREATMENT—About 50 g of fruits and stems are boiled in 10 to 12 L of water until 2 L have boiled away. The decoction is left to cool overnight, and in the morning it is used as bathwater. Another method of relieving skin irritation is to drink one cup of the decoction per day for about three days; with this treatment the rash slowly disappears.

SOURCE—Collected in the Kalat and Kachhi areas.

PRICE—10 rupees/kg.

Peganum harmala L. (Icon.: El-Hadidi, Fl. Iran. 98: 18, tab. 14, 1972).

VOUCHER SPECIMEN—AG & SMG 4533.

LOCALITY—Turbat bazaar.

VERNACULAR NAME—*gāndākū*.

USES—To relieve fever, stomachache, and gas.

TREATMENTS—Between 10 and 15 g of seeds are ground into a fine powder and then swallowed with water to relieve digestive tract pain associated with indigestion or excess stomach gas. The fumes of burning seeds are inhaled by the patient to reduce fever.

SOURCE—Common in Kalat and Khuzdar area.

PRICE—20 rupees/kg.

COMMENTS—The ethnobotanical uses of this plant in Pakistan are reviewed by Zaman and Khan (1970, pp. 54–55). Turchetta (1989) noted that in the Quetta bazaars the seeds are sold for medicinal purposes.

VOUCHER SPECIMEN—Not collected.

LOCALITY—Pasni bazaar.

VERNACULAR NAME—*gāndākū*.

USE—To exorcise the spells of *jin* and other evil spirits.

PROCEDURE—A small amount of seeds are burned on hot coals and the smoke is inhaled by the person under the spell. In a formal treatment by an *aamal* (B, U), the exorcist, the *gāndākū* seeds are mixed with those of red chili and some hairs of a black goat and the mixture is then burned. The *aamal* blows the smoke at the patient while reciting Quranic phrases; this is thought to induce the spirit to leave. The treatment is repeated once or twice per day until the *aamal* is satisfied that the *jīn* has departed.

SOURCE—Although this plant is common in the immediate vicinity of Pasni, the stock sold in the local bazaar is obtained from wholesale herb merchants in Karachi.

PRICE—60 rupees/kg.

***Tribulus terrestris* L.** (Icon.: El-Hadidi, Fl. Iran. 98: 15, tab. 17, 18, 1972).

VOUCHER SPECIMEN—AG & SMG 5251.

LOCALITY—Kalat bazaar.

VERNACULAR NAME—*ghūr gān* (Br).

USE—To relieve urinary tract irritation associated with kidney stones.

TREATMENT—Between 15 and 20 g of fruit are ground into a fine powder and mixed with water to form a syrup, which is then strained and a small amount of sugar added. One tablespoonful of the syrup is mixed in a glass of water and drunk. This treatment, which helps dissolve kidney stones, is repeated three times per day until symptoms disappear. This same treatment is also used to activate the menstrual cycle in females and to increase sexual prowess in males.

SOURCE—Common in the Kalat area.

PRICE—10 rupees/kg.

COMMENTS—Zaman and Khan (1970, pp. 70–71) review the ethnobotanical uses of this plant in Pakistan.

***Zygophyllum eurypterum* Boiss. & Buhse** (Icon.: Ghafoor, Fl. W. Pak. 76: 32, fig. 6K–N, 1974).

VOUCHER SPECIMEN—AG & SMG 4884.

LOCALITY—Bella bazaar.

VERNACULAR NAME—*āloonj*.

USE—To relieve stomach pain and gas.

TREATMENT—About 10 g of fruit are soaked in a glass of water overnight, and in the early morning the liquid is boiled until ¼ of it remains. The decoction is then strained, cooled, and drunk. In

mild cases one dose is taken per day, in extreme cases two doses per day, until symptoms disappear. For children under the age of 10 years, the initial amount used in making the decoction is 5 g.

SOURCE—Near Mastung, Nal, and Besima.

PRICE—60 rupees/kg.

VOUCHER SPECIMEN—AG & SMG 5013.

LOCALITY—Khuzdar bazaar.

VERNACULAR NAME—*āloonj*.

USE—To relieve thirst associated with fever, particularly malarial fever.

TREATMENT—Ten grams of fruit are soaked in a glass of water for two to three hours, strained, and drunk. Generally the treatment is given two or three times per day for about one week. For this treatment, *āloonj* and *bōī mādrān* (*Achillea wilhelmsii*, see p. 70) may be substituted one for the other, and some people mix the two plants together.

SOURCE—In Nal and Besima areas.

PRICE—10 rupees/kg.

RUTACEAE

***Haplophyllum tuberculatum* (Forssk.) F. W. Ander.** (Icon.: Hassan-ud-din & Ghazanfar, Fl. Pak. 132: 6, fig. 2A–B, 1980).

syn.: *Ruta tuberculata* Forssk.

VOUCHER SPECIMEN—AG & SMG 4760.

LOCALITY—Gwadar bazaar.

VERNACULAR NAMES—*sādāf*, *sādāp*.

USE—As a cough suppressant.

TREATMENT—About 30 g of stem and seed are powdered, boiled for a short period in 1½ cups of water, and the decoction is strained and drunk. This dose is given once in the morning and again in the evening for up to three days.

An informant in the Pasni bazaar described the same use and treatment. They noted, though, that this procedure should only be used for adults. The treatment for children under the age of two years involves frying the partially ground herb in mustard oil, then rubbing the resulting ointment on the head and placing a small amount at the opening of the child's nares. This treatment is given in the morning and evening for three days.

SOURCE—Hill country of Makran.

PRICE—40 rupees/kg.

VOUCHER SPECIMEN—AG & SMG 4896.

LOCALITY—Bella bazaar.

VERNACULAR NAME—*gāndrēm*.

USE—As a cough suppressant.

TREATMENT—Between 40 and 50 g of stems are boiled in one glass of water, and when $\frac{1}{2}$ of the liquid remains, the decoction is strained and drunk. The normal dosage for adults and children is $\frac{1}{2}$ glass in the morning and $\frac{1}{2}$ glass in the evening until the symptoms disappear. This decoction is also given to domestic animals for the same purpose. The quantity of herb used for cattle is 150 g; for goats and sheep it is 75 g.

SOURCE—Mountains near Khuzdar.

PRICE—16 rupees/kg.

BURSERACEAE

Commiphora wightii (Arn.) Bhandari (Icon.: Abdulla, Fl. W. Pak. 26: 3, fig. 1J–Q, 1972).

syns.: *Balsamodendron wightii* Arn.; *B. mukul* Hook. ex Stocks; *Commiphora mukul* (Hook. ex Stocks) Engl.

VOUCHER SPECIMEN—AG & SMG 4552.

LOCALITY—Turbat bazaar.

VERNACULAR NAME—*kōhī bood*.

USE—To dry up infected skin wounds and pimples.

TREATMENT—The woody portion of the plant and resin are ground on a rough surface, such as a stone, into a paste (no water needs to be added). The resulting poultice is spread on the affected skin surface. This causes a rapid rupturing of the infection and subsequent drying of the wound.

A second species of *Commiphora*, *C. stocksiana* (Engl.) Engl., occurs in the area but is less common. Both species have the same vernacular name and may be substituted for one another without distinction.

SOURCE—Mountains near Turbat.

PRICE—40 rupees/kg.

VOUCHER SPECIMEN—AG & SMG 4772.

LOCALITY—Gwadar bazaar.

VERNACULAR NAME—*kōhī bood*.

USES—To help heal sores on the body (*sīthā*), and as a snake repellent.

TREATMENT AND PROCEDURE—Small pieces of plant resin are placed on hot coals and the area of the body with sores is exposed to the fumes. Another use of this plant is to rid buildings of poi-

sonous snakes. The smoke of the resin is spread throughout the room or area where the animal is suspected of hiding; this “forces” the snake to be “driven away.”

SOURCE—Makran and Quetta hills.

PRICE—20 rupees/kg.

MELIACEAE

Azadirachta indica (L.) A. Juss (Icon.: Abdulla, Fl. W. Pak. 17: 5, fig. 2A–B, 1972).

syn.: *Melia azadirachta* L.

VOUCHER SPECIMEN—AG & SMG 4802.

LOCALITY—Pasni bazaar.

VERNACULAR NAMES—*shīrīsh*, *nēēm* (U).

USES—To treat stomach pain and diarrhea in children between the ages of three and seven years, to relieve rash, to exorcise *jīn* or other evil spirits, and to get rid of head lice.

TREATMENTS—The preparation for stomach ailments uses ripe fruit, which are dried and stored. About five fruits are boiled in $\frac{1}{2}$ cup of water. When $\frac{1}{4}$ cup of the liquid remains the decoction is strained and stored. Two teaspoonfuls of the medicine are taken orally twice per day until symptoms disappear.

For the treatment of skin irritation, generally in the form of a rash (*pī*) in the hot season, leaves of the plant are ground and pressed and the resulting oily liquid is stored. This juice is mixed with candied sugar (*misri*) and a single tablespoonful is taken orally twice each day, in the morning and evening, until the rash disappears. It is thought to act as a coolant by removing heat from the body.

When a *jīn* has taken possession of a house, the fruits are burned on hot coals and the smoke is spread throughout the building. When it is believed that a *jīn* has put a spell on a person, the victim is made to inhale a small quantity of smoke. In both cases the *jīn* departs when exposed to the fumes.

To treat hair lice the fruits are ground to a fine powder and mixed with oil; olive oil is preferred. The mixture is then applied directly to the scalp as a shampoo. One application is usually considered sufficient to kill the lice.

SOURCE—Cultivated locally.

PRICE—10 rupees/kg.

COMMENTS—Zaman and Khan (1970, p. 17) review the medicinal use of this plant in Pakistan and mention many of the above treatments.

VOUCHER SPECIMEN—AG & SMG 4883.

LOCALITY—Bella bazaar.

VERNACULAR NAMES—*shīrīsh*, *nīmōlī* (L), *nēēm* (U).

USE—To relieve pain and bleeding associated with hemorrhoids.

TREATMENT—The fruit pulp is separated from seeds. Six or seven seeds are taken orally each night before bed. Another informant mentioned that the fruits are cut in half, the seeds discarded, and the pulp taken orally. With regular usage this treatment relieves the pain associated with hemorrhoids and stops bleeding, but it does not dry up the piles. If the patient stops eating the seeds, the pain and bleeding reactivate.

SOURCE—Cultivated in region.

PRICE—5 rupees/kg.

EUPHORBIACEAE

Ricinus communis L. (Icon.: Radcliffe-Smith, Fl. Pak. 172: 69, fig. 14A–D, 1986).

VOUCHER SPECIMEN—AG & SMG 4770.

LOCALITY—Gwadar bazaar.

VERNACULAR NAME—*mōrpād*.

USES—To relieve jaw pain, and to treat mumps and tonsillitis.

TREATMENT—Ripe seeds are roasted, ground into a paste (no water needs to be added), then applied to the painful area of the jaw. This poultice is left on for one day, washed off the following day, and then immediately reapplied. This treatment continues for up to three days and is used for all of the above ailments. When asked, the informant stated that the plant is not used locally as an anticonstipatory.

SOURCE—Cultivated.

PRICE—Not recorded.

ANACARDIACEAE

Pistacia khinjuk Stocks (Icon.: Nasir, Fl. Pak. 152: 13, fig. 4A, 1983).

VOUCHER SPECIMEN—AG & SMG 5017.

LOCALITY—Khuzdar bazaar.

VERNACULAR NAME—*gwān*.

USES—As an ointment to relieve pain associated with rheumatism and sore muscles. The fruits are also eaten as food and are an ingredient in a traditional local curry.

TREATMENT—The ripe fruits are crushed and the oil extracted. This is then used as an ointment that is rubbed directly on areas of the body with pain. It causes a local warming effect.

SOURCE—Fruits are obtained from the hill country around Quetta, near Kalat, and other areas of Balochistan.

PRICE—14 rupees/kg.

VOUCHER SPECIMEN—AG & SMG 5246.

LOCALITY—Khuzdar bazaar.

VERNACULAR NAME—*gūn goonjāk*.

USES—To relieve cough, dry up infected sores, and remove hair.

TREATMENTS—For cough relief, about 4 to 5 g of gum (a piece about the size of a green pea) are mixed with grain flour and a small amount of sugar. The mixture is then placed on hot coals and the fumes are inhaled by the patient. It was recommended that the person continue to inhale the fumes until he or she can take no more. During the exposure to the smoke, the patient is advised to keep the eyes closed. Treatment should be performed at night before bed, and generally one treatment is considered sufficient to relieve symptoms; if not, the procedure may be repeated for up to three nights.

The treatment for open sores involves placing a small amount of gum on hot coals and passing the wound over the fumes. This tends to be a slow remedy. For quick relief it is better to grind up a small amount of gum, mix it with water, and apply the paste directly to the infected area. Our informant mentioned that the sores will then immediately burst and quickly dry up. The sores or pimples tend to occur in “soft places” such as on the groin, in the armpits, etc., and are thought to be caused by poor diet and unhygienic conditions.

As a depilatory, small pieces of cloth (the size of the patch of hair to be removed) are covered with powdered gum on one side and then exposed to the hot sun. Once the gum has melted, the cloth is placed gum side down on the skin, left to cool, and then removed, taking the hair with it.

SOURCE—Surab area.

PRICE—100 rupees/kg.

SAPINDACEAE

Dodonaea viscosa (L.) Jacq. (Icon.: Abdulla, Fl. W. Pak. 39: 3, fig. 1A–E, 1973).

syn.: *Ptelea viscosa* L.

VOUCHER SPECIMEN—AG & SMG 4549.

LOCALITY—Turbat bazaar.

VERNACULAR NAME—*gēytēchāk*.

USE—To alleviate symptoms of jaundice (*kā-wāl*).

TREATMENT—Between 30 and 40 g of leaves, stems, and flowers are soaked in one glass of water overnight. The following morning the infusion is strained and then drunk by the patient. Sometimes a small amount of alum (*phitkry*) is added as a water purifier. The treatment is repeated each morning until symptoms disappear.

SOURCE—Khuzdar area.

PRICE—40 rupees/kg.

VOUCHER SPECIMEN—AG & SMG 4761.

LOCALITY—Gwadar bazaar.

VERNACULAR NAME—*gēytēchāk*.

USE—To treat asthma.

TREATMENT—Between 10 and 15 g of leaves and stems are smoked in a water pipe in the same fashion as tobacco. Used whenever needed.

SOURCE—Throughout the Makran area.

PRICE—40 rupees/kg.

RHAMNACEAE

Zizyphus nummularia (Burm. f.) Wight & Arn.
(Icon.: Qaiser & Nazimuddin, Fl. Pak. 140:
12, fig. 3E–G, 1981).

syn.: *Rhamnus nummularia* Burm. f.

VOUCHER SPECIMEN—Not collected.

LOCALITY—Gwadar bazaar.

VERNACULAR NAME—*bēr*.

USE—As a hair shampoo.

PROCEDURE—Fresh leaves are ground and pressed. The resulting liquid is mixed with a small amount of water and used as a standard shampoo.

SOURCE—Throughout the hill country of southern Balochistan.

PRICE—8–10 rupees/kg.

TILIACEAE

Corchorus depressus (L.) Stocks (Icon.: Browicz,
Fl. Iran. 148: 2, tab. 1, 1981).

syn.: *Antichorus depressus* L.

VOUCHER SPECIMEN—AG & SMG 4529.

LOCALITY—Turbat bazaar.

VERNACULAR NAME—*mündērī*.

USES—To relieve itching and irritation of the urinary tract. Also, to thicken semen and hence increase male virility.

TREATMENTS—Between 25 and 30 g of mixed leaves, stems, and fruits are soaked in one glass of water overnight and the following morning, before breakfast, the infusion is drunk by the patient. As a second method, 25 g of powdered plant are taken orally at night before bed and again in the morning before breakfast.

SOURCE—Weed found in cultivated fields near Khuzdar, Turbat, and Gwadar areas.

PRICE—40 rupees/kg.

TAMARICACEAE

Tamarix aphylla (L.) Karst. (Icon.: Qaiser, Fl. Pak.
141: 31, fig. 13A–1, 1982).

syn.: *Thuja aphylla* L.

VOUCHER SPECIMEN—AG & SMG 4886.

LOCALITY—Bella bazaar.

VERNACULAR NAMES—*gāz*, *gāz khōr* (L).

USE—To relieve body pain, particularly pain of the back and rib muscles.

TREATMENT—Ten grams of gum are brought to a boil in one cup of milk. This liquid is then cooled and drunk. The dose is taken once in the morning and again in the evening for at least three days, or until the pain is gone. The gum is obtained by making lateral cuts in tree trunks, after which the resin slowly oozes out, solidifies, and is collected.

SOURCE—Common throughout the Bella area.

PRICE—100 rupees/kg.

COMMENTS—More details on the technique used for gathering gum in the Kharan area are given in the Balochistan District Gazetteer Series (1907, vol. VII–A, pp. 111–112).

LYTHRACEAE

Lawsonia inermis L. (Icon.: Dar, Fl. W. Pak. 78:
5, fig. 1A–C, 1975).

VOUCHER SPECIMEN—AG & SMG 4765.

LOCALITY—Gwadar bazaar.

VERNACULAR NAME—*hēnnā*.

USES—As a coolant in humans and as a remedy for digestive tract disorders in donkeys.

TREATMENTS—The leaves and stems are ground and mixed with water to form a paste. The poultice is then applied to the heels of the patient, which draws heat from the body. It is also used to dye hair and as a paint for decorative designs on the skin.

A secondary use of the plant is to treat severe flatulence in donkeys. About 100 g of plant material is boiled in a small quantity of water. The resulting decoction is strained and the animal is forced to drink it.

SOURCE—Cultivated in the Makran area.

PRICE—40 rupees/kg.

MYRTACEAE

Myrtus communis L. (Icon.: Qaiser, Fl. Libya 122: 2, fig. 1, 1986).

VOUCHER SPECIMEN—AG & SMG 4757.

LOCALITY—Gwadar bazaar.

VERNACULAR NAME—*mōrt*.

USE—To relieve itching of the anus caused by pinworms.

TREATMENT—A small amount of powdered leaves is applied directly to the anus at night before bed. Treatment is repeated whenever necessary.

SOURCE—Makran area.

PRICE—40 rupees/kg.

COMMENTS—Zaman and Khan (1970, p. 51) review the ethnobotanical uses of this plant in Pakistan. In the Quetta area an infusion made from dried branches is used as a "decongestive for [the] eyes" (Turchetta, 1989, p. 19). This plant has been introduced into Balochistan.

VOUCHER SPECIMEN—AG & SMG 5015.

LOCALITY—Khuzdar bazaar.

VERNACULAR NAME—*mōrt*.

USES—To regulate the menstrual cycle, particularly after childbirth. Also, to treat uterine infections after parturition.

TREATMENTS—About 10 g of leaves are boiled in one cup of water. When $\frac{1}{2}$ of the liquid is left, the decoction is strained and sweetened with white or brown sugar. The recommended dosage is $\frac{1}{2}$ cup of the liquid in the morning and $\frac{1}{2}$ cup again in the evening for three days.

SOURCE—Johan hills near Kalat (fig. 18).

PRICE—10 rupees/kg.

VOUCHER SPECIMEN—Not collected.

LOCALITY—Pasni bazaar.

VERNACULAR NAME—*mōrt*.

USES—To prevent general infection in newborn infants and to relieve itching of the anus, in both adults and children, caused by pinworms.

TREATMENTS—A small amount of ground fruit is mixed with the water used to bathe newborn infants. This infusion acts as a "tonic" against various diseases. The child should be bathed in this manner daily or every few days up to the age of six months. To relieve irritation of the anus, a small amount of the powdered herb is applied directly to the orifice before bedtime.

SOURCE—Mountains near Kalat.

PRICE—30 rupees/kg.

UMBELLIFERAE

Anethum graveolans L. (Icon.: Hedge et al., Fl. Iran. 162: 345, tab. cl. gr. A-1, 1987).

syns.: *Anethum sowa* Roxb. ex Flem.; *Peucedanum graveolens* (L.) Bth. & Hook.

VOUCHER SPECIMEN—AG & SMG 4534.

LOCALITY—Turbat bazaar.

VERNACULAR NAME—*chōtā gwāthāk*.

USE—To relieve constipation and excess stomach gas.

TREATMENT—The seeds are ground into a fine powder and then taken orally with water. The dosage for adults is about 10 g—a greater quantity induces diarrhea. For children, a decoction of the herb is drunk—they should not directly consume the powder. One application is considered sufficient to relieve these symptoms in both adults and children. We found no evidence that the seeds are used as a spice in southern Balochistan.

SOURCE—Cultivated in Kalat area.

PRICE—80 rupees/kg.

VOUCHER SPECIMEN—AG & SMG 4810.

LOCALITY—Pasni bazaar.

VERNACULAR NAMES—*chōtā gwāthāk*, *sōyā* (U).

USE—To relieve stomach and chest pain. Also, eaten as a vegetable.

TREATMENT—About 30 g of seed are ground into powder and swallowed with water. This dose is taken twice or thrice per day until the symptoms disappear. The green portions of the plant are used as a fresh vegetable.

SOURCE—Cultivated locally.

PRICE—Generally 20–30 rupees/kg, sometimes as much as 40 rupees/kg.



FIG. 18. Grove of *Myrtus communis* growing in Johan at about 1550 m altitude. These trees are the source of much of the *mort* sold in the herbal markets of Khuzdar (see p. 59). (Photo taken 13 May 1991 by S. M. Goodman.)

***Ferula assa-foetida* L.** (Icon.: Linnaeus, Amoen. Acad. Exot. Fasc.: tab. 18, 1722).

syn.: *Ferula foetida* Regel.

VOUCHER SPECIMEN—AG & SMG 4538.

LOCALITY—Turbat bazaar.

VERNACULAR NAME—*hīng*.

USES—To relieve pain associated with toothache and gingivitis. Also used as a vermifuge, and to relieve gas pains.

TREATMENTS—A small piece of resin is placed in the mouth between the gums and inner surface

of the lips. This poisons any worms living in the gums and they subsequently fall out.

To kill gastrointestinal parasites, from 5 to 10 g of plant resin are powdered and administered orally each day for three days. Generally the treatment is used for tapeworms (trematodes) and roundworms (nematodes). To relieve gas problems, between 5 and 10 g of powdered fruit are taken orally in the evening before bed.

SOURCE—In the mountains near Quetta, Buleda, and Zamuran.

PRICE—Resin, 40 rupees/kg, and fruits, 20 rupees/kg.

COMMENTS—Turchetta (1989) noted that in the Quetta bazaar the dried resin of this plant is sold as a vermifuge.

VOUCHER SPECIMEN—AG & SMG 4774.

LOCALITY—Gwadar bazaar.

VERNACULAR NAME—*pātrāk*.

USE—As a purgative for children up to two years old.

TREATMENT—Five grams of seed are boiled in one cup of water for a short period; the decoction is then strained and drunk. This dose is taken orally in the morning and again in the evening for up to three days.

SOURCE—The Makran area, also common near Khuzdar.

PRICE—50 rupees/kg.

VOUCHER SPECIMEN—AG & SMG 4805.

LOCALITY—Pasni bazaar.

VERNACULAR NAME—*pātrāk*.

USES—As an aid in tooth extraction, an anti-constipatory, and an ingredient in a compound medicine to treat stomach pain and restlessness in children.

TREATMENTS—About ½ g of powdered seed is applied to the tooth scheduled for extraction and the surrounding gum. After one hour the tooth has loosened and is easily removed. As a purgative, between 2 and 5 g of ground herb are taken orally each day until the constipation passes. (For the treatment of stomach pain and restlessness in children, see p. 62.)

SOURCE—Not recorded.

PRICE—20 rupees/kg from one merchant and 60 rupees/kg from another.

VOUCHER SPECIMEN—AG & SMG 5011.

LOCALITY—Khuzdar bazaar.

VERNACULAR NAME—*hīng pātrāk*.

USES—To relieve the pain and discomfort associated with pinworms, piles, and earache.

TREATMENTS—For pinworms and piles, a small quantity of fruit is boiled in one cup of water until ½ of the liquid is left. It is then strained and drunk. Two grams of fruit are used for children between the ages of six months and one year and 10 g for older patients. This dosage is taken twice per day, once in the morning and again in the evening, for three days. Pinworms are suspected when the anus constantly itches. In severe cases the worms can be seen in the feces. Some people use the plant as

a vermifuge, in which case the leaves are boiled like spinach and eaten.

To treat earache, about ¼ g of plant gum is ground into fine powder, mixed with about 2 ml of water and/or mustard oil, and then stirred until completely dissolved. On the first day of treatment, two or three drops of the liquid are placed in the ear in the early morning, at midday, and in the evening before bed. If the pain continues, the treatment is repeated for another day.

SOURCE—Areas between Surab and Besima, also near Kharan.

PRICE—Fruit, 15 rupees/kg, and gum, 300 rupees/kg.

Psammogeton biternatus Edgew. (Icon.: Hedge et al., Fl. Iran. 162: 148, tab. 97, 1987).

VOUCHER SPECIMEN—AG & SMG 4775.

LOCALITY—Gwadar bazaar.

VERNACULAR NAME—*būzi izbūthāk*.

USE—To relieve stomach pain.

TREATMENT—About 50 g of seeds and a dried lemon are crushed and boiled in one glass of water. When ½ of the liquid remains, the decoction is strained and drunk. Generally the treatment consists of two such doses per day, in the morning and in the evening, until symptoms disappear. In acute cases it is given thrice per day.

SOURCE—In the hills of western Makran (toward the Iranian border), near Mastung and Panjgur.

PRICE—Generally the plant is common after rains and costs 10 rupees/kg; when not readily available, 50 rupees/kg.

Trachyspermum ammi (L.) Sprague (Icon.: Nasir, Fl. W. Pak. 20: 72, fig. 21D–F, 1972).

syn.: *Sison ammi* L.; *Ammi copticum* L.

VOUCHER SPECIMEN—AG & SMG 4540.

LOCALITY—Turbat bazaar.

VERNACULAR NAME—*izboothāk*.

USES—To alleviate pain associated with stomach gas and chest pain centered in the heart area (“heartburn”). The plant is also an important component in compound (*mūrākkābāt*) medicines.

TREATMENT—To relieve symptoms associated with all of these ailments, about 5 g of finely ground seeds are taken orally twice per day until the condition becomes normal.

SOURCE—Cultivated in Kalat area.

PRICE—20 rupees/kg.

VOUCHER SPECIMEN—AG & SMG 4771.

LOCALITY—Gwadar bazaar.

VERNACULAR NAME—*izboothāk*.

USE—To relieve stomach pain and indigestion.

TREATMENT—About 10 g of seed are ground to a fine powder and taken orally with water. In mild cases a single dose is sufficient. In more acute cases two or three doses are given daily until the symptoms disappear.

SOURCE—Cultivated in areas of Makran and Sindh.

PRICE—20 rupees/kg.

VOUCHER SPECIMEN—AG & SMG 4808.

LOCALITY—Pasni bazaar.

VERNACULAR NAME—*izboothāk*.

USES—To treat indigestion and to relieve pain associated with internal injury.

TREATMENTS—For indigestion, about 10 g of seed are ground to a fine powder and swallowed with water. Alternatively, a decoction is made by boiling the same amount of seed in one glass of water and the liquid is drunk.

To relieve pain associated with trauma (such as injury in a child from being hit with a ball), the seeds are ground and then the juice is extracted, collected, and mixed with mustard oil. This ointment is applied directly to the hurt area every few hours. Generally four to five applications is considered sufficient.

SOURCE—Not recorded.

PRICE—Not recorded.

Zosima absinthifolia (Vent.) Link (Icon.: Nasir, Fl. W. Pak. 20: 168, fig. 50A–C, 1972).

syn.: *Heracleum absinthifolium* Vent.

VOUCHER SPECIMEN—AG & SMG 4548.

LOCALITY—Turbat bazaar.

VERNACULAR NAME—*bārā gwāthāk*.

USE—To relieve constipation and general stomach malaise.

TREATMENT—Between 5 and 10 g of mixed ground stems and seeds are swallowed with water in the morning and again in the evening. This dosage is only used for adults, and the symptoms usually pass after one day of treatment. Children

do not consume the powder directly but are given a decoction made from the seeds.

SOURCE—Kalat and Surab areas.

PRICE—60 rupees/kg.

VOUCHER SPECIMEN—AG & SMG 4806.

LOCALITY—Pasni bazaar.

VERNACULAR NAME—*bārā gwāthāk*.

USE—To treat stomach ailments and restlessness in children up to five years old.

TREATMENT—Five grams of seed are soaked in a glass of water overnight, and in the morning the infusion is boiled for a short period. The resulting decoction is strained and combined with 2 or 3 g of ground *Ferula assa-foetida* (*pātrāk*, see p. 61) seeds and a dried lemon. One teaspoonful of this mixture is taken twice per day until symptoms disappear.

SOURCE—Cultivated locally.

PRICE—40 rupees/kg.

VOUCHER SPECIMEN—AG & SMG 5003.

LOCALITY—Khuzdar bazaar.

VERNACULAR NAME—*gwāthāk*.

USES—To treat dysentery and diarrhea in children, tonsillitis, and general loss of voice.

TREATMENTS—For dysentery and diarrhea, about 5 g of powdered seed are swallowed with water in the early morning, at midday, and in the evening for three days. If symptoms continue, the procedure is extended for up to another two days. For throat ailments, 5 g of seed mixed with some candied sugar (*misri*) are sucked on for an hour or so and then discarded. This treatment should be given in the morning and again in the early evening for two or three days.

SOURCE—Not known.

PRICE—20 rupees/kg.

OLEACEAE

Olea ferruginea Royle (Icon.: Grohman, Fl. W. Pak. 59: 9, fig. 2A–B, 1974).

syn.: *Olea cuspidata* Wall. ex G. Don.

VOUCHER SPECIMEN—AG & SMG 4550.

LOCALITY—Turbat bazaar.

VERNACULAR NAME—*aāth kā pāttā*.

USE—To relieve stomach pain.

TREATMENT—About 5 of ground leaves are swallowed with water, which generally gives im-

mediate relief of stomach pain. Alternatively, a decoction of the leaves can be used.

SOURCE—Zamuran Hills and near Buleda.

PRICE—40 rupees/kg.

VOUCHER SPECIMEN—AG & SMG 4882.

LOCALITY—Bella bazaar.

VERNACULAR NAMES—*aāth kā pāttā, kāhū jā pānn* (L).

USE—As an emetic, generally associated with heat stroke or food poisoning.

TREATMENT—About 5 g of leaves are boiled in one cup of water until $\frac{1}{2}$ of the liquid remains. The decoction is then strained and mixed with a small amount of salt. In mild cases one dose is generally considered sufficient for the symptoms to pass, and in acute cases two doses should suffice. This plant is also an important ingredient in Unani composite medicines.

SOURCE—Mountains north of Bella and also in the Mor Range.

PRICE—12 rupees/kg.

GENTIANACEAE

Gentiana oliverii Griseb. (Icon.: Jaubert & Spach, Ill. Fl. Or. 3, tab. 234, 1848).

VOUCHER SPECIMEN—AG & SMG 5009.

LOCALITY—Khuzdar bazaar.

VERNACULAR NAME—*bāngērō*.

USE—To treat diseases of the liver and spleen, which might be related to hepatitis.

TREATMENT—Ten grams each of stems and flowers are boiled in one cup of water. When $\frac{3}{4}$ of the liquid is left, the decoction is strained and drunk. Generally two doses are taken per day, once in the morning and again in the evening, for one week. All symptoms associated with the disorder normally disappear within one week.

SOURCE—Hills near Quetta.

PRICE—When common, 30–40 rupees/kg; when scarce, 100 rupees/kg.

APOCYNACEAE

Rhazya stricta Dcne. (Icon.: Rechinger, Fl. Iran. 103: 7, tabs. 4, 5, 1974).

VOUCHER SPECIMEN—AG & SMG 4554.

LOCALITY—Turbat bazaar.

VERNACULAR NAME—*īshrēk*.

USE—As a cooling agent.

TREATMENT—A small quantity of mixed leaves and stems is powdered, combined with a fragment of pulverized antimony oxide, and applied to the inner surface of the eyelids. Some people also eat the plant to remove “dryness in the body.”

SOURCE—Common in the general Turbat area and throughout Makran.

PRICE—16 rupees/kg.

VOUCHER SPECIMEN—AG & SMG 4762.

LOCALITY—Gwadar bazaar.

VERNACULAR NAME—*īshrēk*.

USES—To rid the digestive tract of parasitic worms and to relieve hemorrhoidal pain.

TREATMENTS—As a vermifuge, about 10 g of leaves are boiled in one cup of water, and when $\frac{1}{3}$ of the liquid remains, the resulting liquid is strained and drunk. The typical treatment is $\frac{1}{3}$ cup of the decoction taken twice per day, in the morning and evening, for two or three days. In the case of hemorrhoids, about 10 g of powdered plant material are swallowed with water twice per day for three to seven days.

SOURCE—Found throughout Balochistan.

PRICE—35–40 rupees/kg.

ASCLEPIADACEAE

Caralluma edulis (Edgew.) Benth. (Icon.: Ali, Fl. Pak. 150: 46, fig. 10A–F, 1983).

syn.: *Boucerosia edulis* Edgew.; *B. stocksiana* Boiss.

VOUCHER SPECIMEN—AG & SMG 4764.

LOCALITY—Gwadar bazaar.

VERNACULAR NAME—*āpītāk*.

USE—Eaten as a salad green or boiled vegetable. One person mentioned that if the plant is picked in the morning, by the time it reaches the market most of the sourness is gone.

SOURCE—Collected locally.

PRICE—15 rupees/kg.

Caralluma tuberculata N. E. Brown (Icon.: Ali, Fl. Pak. 150: 48, fig. 11A–E, 1983).

VOUCHER SPECIMEN—AG & SMG 4536.

LOCALITY—Turbat bazaar.

VERNACULAR NAME—*mārmootāk*.

USES—As a vermifuge, and to relieve general

pain of the digestive tract. Also eaten raw as a vegetable.

TREATMENTS—To rid the gastrointestinal tract of parasitic worms, about 5 to 10 g of powdered dried plant material are swallowed with water in the morning and again in the evening for seven days. This medication should always be taken at least three hours after the most recent meal. The same dosage is used in cases of stomach pain, and then the treatment is continued until the symptoms disappear.

SOURCE—Common after winter rains in the hilly country near Khuzdar, Kalat, Bella, and the Central Makran Range.

PRICE—40 rupees/kg.

COMMENTS—Turchetta (1989) noted that this species is sold in the Quetta bazaar to treat stomachache.

VOUCHER SPECIMEN—Not collected.

LOCALITY—Pasni bazaar.

VERNACULAR NAME—*mārmoor*.

USES—To counteract snakebite and scorpion and insect stings.

TREATMENTS—For snakebite, a poultice of ground plant material is applied directly to the wound and replaced every one to two hours for up to two days. Simultaneously with this treatment, about 5 g of the poultice are taken orally with water twice per day. For noxious insect and scorpion stings, the same poultice is applied directly to the affected area until the swelling and pain subside. The treatment is thought to “suck out” the poison.

SOURCE—Collected in the general Pasni area.

PRICE—28 rupees/kg.

VOUCHER SPECIMEN—AG & SMG 4897.

LOCALITY—Bella bazaar.

VERNACULAR NAME—*sāpmōī* (L).

USES—To relieve sneezing, running nose, and gas problems in infants between the age of two and four months.

TREATMENTS—About 10 to 15 g of plant material are boiled in one cup of water, and when ½ of the liquid remains, the decoction is strained and stored. Generally the dosage is two tablespoonfuls in the morning and again in the evening until symptoms disappear.

SOURCE—The Bella plains, generally only after rains.

PRICE—25 rupees/kg.

COMMENTS—When asked, an herbalist and other people in Bella stated that this plant is different

from *āpītāk* and *mārmootāk* and that it is not eaten locally as a vegetable.

Glossonema varians (Stocks) Benth. (Icon.: Ali, Fl. Pak. 150: 17, fig. 5A–E, 1983).

syn.: *Mastostigma varians* Stocks.

VOUCHER SPECIMEN—AG & SMG 4763.

LOCALITY—Gwadar bazaar.

VERNACULAR NAME—*shāgūshāk*.

USE—Fruits are eaten uncooked as food. Sold in the general market and not in herbalist shops.

SOURCE—Common in Gwadar area after rains.

PRICE—5 rupees/kg.

BORAGINACEAE

Trichodesma africanum (L.) R. Br. (Icon.: Nasir, Fl. Pak. 191: 90, fig. 25A–C, 1989).

syns.: *Borago africana* L.; *B. verrucosa* Forssk.

VOUCHER SPECIMEN—AG & SMG 4543.

LOCALITY—Turbat bazaar.

VERNACULAR NAME—*chārmēng*.

USES—To relieve lung congestion and pain in the chest.

TREATMENT—About 30 g of leaves are boiled in two glasses of water, and when one glass of liquid remains, the decoction is strained and drunk. The normal dose is one glass per day before bed until symptoms disappear.

SOURCE—Turbat area, and particularly common near Buleda.

PRICE—32 rupees/kg.

VERBENACEAE

Vitex negundo L. (Icon.: Jafri & Ghafoor, Fl. W. Pak. 77: 27, fig. 6, 1974).

VOUCHER SPECIMEN—AG & SMG 4773.

LOCALITY—Gwadar bazaar.

VERNACULAR NAME—*gwānāk*.

USE—To clean the womb after childbirth.

TREATMENT—Thirty grams of mixed leaves, stems, and seeds are boiled in one cup of water for a short period; the decoction is then strained. (Another informant mentioned that 100 g should be used.) The recommended dose is one cup of

the decoction drunk in the morning and another in the evening for an unspecified period of time. Treatment generally commences five days after parturition.

SOURCE—Found in the hills north of Turbat.

PRICE—5 rupees/100 g.

LABIATAE

Mentha longifolia (L.) L. (Icon.: Feinbrun-Dothan, Fl. Palaest. 3: 159, pl. 261, 1977).

syn.: *Mentha spicata* var. *longifolia* L.

VOUCHER SPECIMEN—AG & SMG 4530.

LOCALITY—Turbat bazaar.

VERNACULAR NAME—*jānglī pōdīnā*.

USE—To relieve thirst.

TREATMENT—Between 25 and 30 g of leaves and flowers are soaked in water overnight, and in the morning the infusion is strained and drunk. The treatment tends to reduce the intensity of thirst on hot days, particularly during the summer months.

SOURCE—Kalat area.

PRICE—40 rupees/kg.

COMMENTS—Turchetta (1989) mentioned that in the Quetta bazaar a *Mentha* sp., known locally as *simsook*, is sold as a cold treatment.

Mentha piperita L. (Icon.: Sastri, Wealth Ind. 6: 342, fig. 124, 1962).

VOUCHER SPECIMEN—AG & SMG 4890.

LOCALITY—Bella bazaar.

VERNACULAR NAMES—*pūdnā*, *pōdīnā*.

USE—Stems and leaves are ingredients in numerous Unani composite (*mūrākkābāt*) plant medicines.

SOURCE—Not recorded.

PRICE—25 rupees/kg.

COMMENTS—This plant is cultivated in the area.

Nepeta juncea Benth. (Icon.: Rechinger et al., Fl. Iran. 150: 168, tab. 155, 1982).

VOUCHER SPECIMEN—AG & SMG 4528.

LOCALITY—Turbat bazaar.

VERNACULAR NAME—*sīmsōk*.

USE—To relieve acute cough and bronchitis.

TREATMENT—Approximately 25 to 30 g of stems and leaves are boiled in one cup of water, and

when ½ of the liquid is left, the decoction is strained and drunk. The treatment is only given at night before bed and continues until symptoms disappear. The decoction also acts as a mild sedative.

SOURCE—Area around Turbat and the Buleda Hills, and generally in the Central Makran Range.

PRICE—40 rupees/kg.

VOUCHER SPECIMEN—AG & SMG 4898.

LOCALITY—Bella bazaar.

VERNACULAR NAME—*shīmshōk*.

USE—As a decongestant for children up to five years old.

TREATMENT—Ten grams of mixed stems, leaves, flowers, and fruits are boiled in one cup of water. When ½ of the liquid is left the decoction is strained, slightly cooled, and drunk. Treatment is generally taken once in the morning and again in the evening until symptoms disappear. The plant is also known to make cats playful after eating a small quantity.

SOURCE—Mountains near Khuzdar.

PRICE—20 rupees/kg.

VOUCHER SPECIMEN—AG & SMG 5002.

LOCALITY—Khuzdar bazaar.

VERNACULAR NAME—*sīmsōk*.

USE—To relieve cough.

TREATMENT—Ten grams of leaves and flowers are boiled in one cup of water, and when ½ of the liquid remains, the decoction is strained and drunk. A small amount of sugar is often added as a sweetener. This dose is taken once in the morning, before breakfast, and again in the evening, before bed, for two or three days.

SOURCE—Found locally in Khuzdar area.

PRICE—10 rupees/kg.

Otostegia persica (Burm. f.) Boiss. (Icon.: Rechinger et al., Fl. Iran. 150: 347, tab. 312, 1982).

syn.: *Molucella persica* Burm. f.

VOUCHER SPECIMEN—AG & SMG 4547.

LOCALITY—Turbat bazaar.

VERNACULAR NAME—*gūrdēr*.

USES—As a treatment of dehydration (*hūskāī*), fever, and arthritic pain, particularly in the feet.

TREATMENTS—For all of the above ailments the same procedure is used. About 30 to 40 g of mixed stems and leaves are soaked in water overnight, and the following morning the infusion is strained and drunk. Treatment continues until symptoms disappear, generally within five days.

SOURCE—Collected in the hills near Panjgur, Zamaran, and Buleda.

PRICE—80 rupees/kg.

VOUCHER SPECIMEN—AG & SMG 4758.

LOCALITY—Gwadar bazaar.

VERNACULAR NAMES—*gürdër, kändërö* (U).

USES—To relieve stomach pain caused by indigestion, to relieve joint pain, and to alleviate respiratory tract congestion caused by the common cold.

TREATMENTS—For stomach and joint pain, about 25 g of mixed flowers and stems are boiled in several glasses of water for about one hour. The decoction is then strained and drunk. Two doses administered during a single day, once in the morning and again in the late evening, are considered sufficient to relieve symptoms. In the case of respiratory tract congestion, about 10 g of the herb are boiled in a shallow pan of water while the patient inhales the vapor.

SOURCE—The material sold in this bazaar was imported from Iran. We found this plant to be relatively common in the hills of southwestern Pakistani Balochistan.

PRICE—40 rupees/kg.

VOUCHER SPECIMEN—Not collected.

LOCALITY—Pasni bazaar.

VERNACULAR NAME—*gürdër*.

USES—To relieve fever and as a general tonic.

TREATMENTS—For fever, 50 g of herb are boiled in one glass of water, and when $\frac{1}{2}$ of the liquid is left, the decoction is strained and drunk. The preparation also acts as a general coolant. As a tonic, particularly in the summer to prevent heat fatigue, a small amount of herb is soaked overnight in a glass of water, and in the morning the infusion is strained and drunk before breakfast.

SOURCE—Although *gürdër* grows in southern Balochistan, the herbalist's source of material was a medicinal plant wholesaler in Karachi.

PRICE—40 rupees/kg.

VOUCHER SPECIMEN—AG & SMG 5008.

LOCALITY—Khuzdar bazaar.

VERNACULAR NAMES—*gürdër, güldër*.

USES—To relieve malarial fever (*jārī*) and to treat jaundice (*kāwāl*).

TREATMENTS—Thirty grams of mixed leaves and stems are soaked in one glass of water overnight, and in the morning the infusion is strained and drunk before breakfast. The standard dosage is one glass per day for at least one week. If symptoms

continue thereafter, treatment is extended for another three or four days. In the case of malaria, the fever is slowly relieved. Jaundice is considered a direct result of malaria, and if the fever can be controlled, the symptoms associated with jaundice, including yellow skin color, should disappear (see pp. 10–11).

SOURCE—Panjgur area.

PRICE—10–15 rupees/kg when abundant and 30 rupees/kg when rare.

Salvia busharica M. Pop. (Icon.: Rechinger et al., Fl. Iran. 150: 422, tab. 457, 1982).

VOUCHER SPECIMEN—AG & SMG 5010.

LOCALITY—Khuzdar bazaar.

VERNACULAR NAME—*gül kākār bāngērō*.

USE—To relieve pain associated with appendicitis (*kāō*).

TREATMENT—Ten grams of mixed flowers and leaves are boiled in one cup of water. When $\frac{3}{4}$ of the liquid is left, the decoction is strained, cooled, and drunk. Generally two such doses are taken each day, once in the morning and again in the evening, for at least one week. This treatment should only be used for mild cases of appendicitis. When the patient has acute symptoms a physician should be consulted.

SOURCE—Areas near Quetta, Pishin, and Loralai.

PRICE—10 rupees/kg.

Teucrium stocksianum Boiss. (Icon.: Rechinger et al., Fl. Iran. 150: 28, tabs. 18, 19, 1982).

VOUCHER SPECIMEN—AG & SMG 4545.

LOCALITY—Turbat bazaar.

VERNACULAR NAME—*kālpūrā*.

USES—To relieve excess stomach gas and itching associated with swollen insect bites.

TREATMENTS—To reduce stomach gas, between 5 and 10 g of mixed stems and leaves are taken orally in the morning and again in the evening. To treat insect bites, a similar quantity of material is ground and mixed with water. The resulting poultice is applied directly to the affected area of skin. Both treatments are continued until symptoms disappear.

SOURCE—Found in the Turbat and Buleda areas.

PRICE—20 rupees/kg.

VOUCHER SPECIMEN—AG & SMG 5001.

LOCALITY—Khuzdar bazaar.

VERNACULAR NAME—*hüssāin bootī*.

USE—To relieve malarial fever.

TREATMENT—Ten grams of mixed leaves and stems are boiled in one cup of water, and when $\frac{3}{4}$ of the liquid is left, the decoction is strained and drunk. Usually three doses are taken per day for three days; if necessary, treatment is continued for up to seven days. After two days there is generally a noticeable reduction in fever.

SOURCE—From Kalat area.

PRICE—15 rupees/kg.

VOUCHER SPECIMEN—AG & SMG 5249.

LOCALITY—Kalat bazaar.

VERNACULAR NAME—*hüssāin bootī*.

USE—To relieve fever associated with malaria and typhoid.

TREATMENT—Between 15 and 20 g of leaves are boiled in two cups of water, and when $\frac{1}{2}$ of the liquid remains, the decoction is strained, sweetened with sugar, and drunk. Generally this dose is given three times per day for two or three days.

SOURCE—Not recorded.

PRICE—10 rupees/kg.

Zataria multiflora Boiss. (Icon.: Hedge, Fl. Pak. 192: 250, fig. 31D–G, 1990).

VOUCHER SPECIMEN—AG & SMG 4531.

LOCALITY—Turbat bazaar.

VERNACULAR NAME—*īzgīnd*.

USES—To relieve cough, severe chest congestion, and itching associated with skin rash.

TREATMENTS—For cough and chest congestion, about 10 to 15 g of mixed stems, leaves, and fruits are boiled in one glass of water. When $\frac{1}{2}$ of the liquid remains, the decoction is strained and drunk. The normal procedure is for one dose to be given in the evening before bed. Symptoms generally disappear within two or three days. To treat skin rash, one handful of the herb is soaked in water for about two hours and the resulting infusion is strained and then used to wash the irritated area. This treatment is thought to reduce the heat associated with rash and mild fever.

SOURCE—Collected in the Zamuran Hills and near Kalat.

PRICE—40 rupees/kg.

VOUCHER SPECIMEN—AG & SMG 4767.

LOCALITY—Gwadar bazaar.

VERNACULAR NAMES—*īzgānd*.

USE—Acts as a cough suppressant.

TREATMENT—About 30 g of mixed leaves, stems, and fruits are boiled in one cup of water for about one hour. The decoction is then strained and drunk. Used whenever needed.

SOURCE—Areas near Makran, Turbat, and Zamuran Hills.

PRICE—25 rupees/kg.

VOUCHER SPECIMEN—AG & SMG 4807.

LOCALITY—Pasni bazaar.

VERNACULAR NAMES—*īzgīnd*, *sāātēr* (U).

USES—To relieve cough and chest congestion; also dries up acne.

TREATMENTS—For cough and chest congestion, about 50 g of mixed leaves, stems, and fruits are boiled in two cups of water, and when one cup remains, the decoction is strained and drunk. Treatment is generally taken once in the early morning and again in the late evening for five consecutive days. For the treatment of acne, the decoction is applied directly to pimples, which causes them to quickly dry up.

SOURCE—Not recorded.

PRICE—15–20 rupees/kg.

VOUCHER SPECIMEN—AG & SMG 4894.

LOCALITY—Bella bazaar.

VERNACULAR NAMES—*īzgīnd*, *sāātēr* (L).

USE—For postparturition care in women; acts to clean the womb.

TREATMENT—Unknown. The material sold in the bazaar was leaves and stems.

SOURCE—Not recorded.

PRICE—20–25 rupees/kg.

COMMENTS—Our informant, a man, did not know the precise details on how this plant was used.

VOUCHER SPECIMEN—AG & SMG 5006.

LOCALITY—Khuzdar bazaar.

VERNACULAR NAME—*īzgīnd*.

USES—To relieve stomach pain and as a cough suppressant.

TREATMENTS—For stomach problems, 10 g of powdered leaves, stems, and fruits are swallowed with cold water. Two such doses in a single day are considered sufficient to relieve the pain. For cough, about 10 g of the herb are boiled in one cup of water, and when $\frac{1}{2}$ of the liquid remains, the decoction is strained, sweetened with sugar, and drunk. Usually one dose is taken per day before bed. In mild cases the treatment should be

continued for three days, and in acute cases for one week.

SOURCE—Not recorded.

PRICE—10 rupees/kg.

VOUCHER SPECIMEN—AG & SMG 5250.

LOCALITY—Kalat bazaar.

VERNACULAR NAMES—*izgānd*, *izghānd* (Br), *sātāar* (U & A).

USES—To relieve stomach gas and pain associated with toothache.

TREATMENTS—Between 5 and 10 g of mixed leaves, stems, and fruits are boiled in one glass of water. When $\frac{1}{2}$ of the liquid remains, the decoction is strained and drunk. Treatment is generally taken once per day for two or three days. A second method is to crush a handful of plant material between the palms of the hand, add a little salt, and swallow the mixture with or without water. A third method is to soak 5 to 10 g of the herb in water overnight, strain the infusion in the morning, and drink the liquid before breakfast. All three methods are effective against stomach gas and toothache.

SOURCE—Not recorded.

PRICE—10 rupees/kg.

Unidentified Labiatae

VOUCHER SPECIMEN—AG & SMG 4542.

LOCALITY—Turbat bazaar.

VERNACULAR NAME—*mōrpāzoo*.

USE—To treat acute cases of dysentery, particularly when there is blood and pus in the feces.

TREATMENT—About 10 g of seed are boiled in one glass of water, and when $\frac{1}{2}$ of the liquid remains, the decoction is strained and drunk. Some people simply chew a handful of the herb; others soak it in water overnight and drink the infusion the following morning. With all of these methods, treatment continues until the symptoms disappear.

SOURCE—Near Buleda and in the Zamuran Hills.

PRICE—80 rupees/kg.

SOLANACEAE

Withania coagulans (Stocks) Dunal (Icon.: Nasir, Fl. Pak. 168: 28, fig. 5E–J, 1985).

syn.: *Puneeria coagulans* Stocks.

VOUCHER SPECIMEN—AG & SMG 4535.

LOCALITY—Turbat bazaar.

VERNACULAR NAME—*pānīrbād*.

USE—To purify blood and treat dermal pimples.

TREATMENT—About 5 g of finely ground dried fruits are taken orally with water twice per day, generally in the early morning and late evening. It is thought that “foreign bodies” in the blood result in the formation of skin pimples.

SOURCE—Found throughout southern Balochistan.

PRICE—20 rupees/kg.

VOUCHER SPECIMEN—AG & SMG 4768.

LOCALITY—Gwadar bazaar.

VERNACULAR NAME—*pānīrbād*.

USE—To relieve stomach pain.

TREATMENT—About 30 g of dried fruits are soaked in one cup of water for one to three hours. The resulting infusion is strained and drunk. In acute cases, or when pain continues after the initial dose, 10 g of ground fruits are taken orally with water. Treatment continues until symptoms disappear.

SOURCE—Areas of western Makran and in neighboring regions of Iran.

PRICE—40 rupees/kg.

VOUCHER SPECIMEN—AG & SMG 4895.

LOCALITY—Bella bazaar.

VERNACULAR NAME—*pānīrbād*.

USE—To relieve stomach pain.

TREATMENT—Fruits are crushed and compacted into round balls that are sold in the markets. About 10 g of fruits for adults (5 g for children) are broken off the ball and swallowed with water. One dose is generally sufficient to relieve stomach pain.

SOURCE—Areas around Kalat, Mastung, and Khuzdar.

PRICE—16 rupees/kg.

SCROPHULARIACEAE

Schweinfurthia papilionacea (Burm. f.) Boiss. (Icon.: Jafri, Fl. Kar., 304, fig. 300, 1974).

syn.: *Antirrhinum papilionaceum* Burm. f.

VOUCHER SPECIMEN—AG & SMG 4553.

LOCALITY—Turbat bazaar.

VERNACULAR NAME—*drūhūd*.

USES—To relieve cough; to relieve postparturition pain.

TREATMENT—A small amount of plant material

(fruits, leaves, and stems) is smoked in a water pipe. The smoke relieves cough and itching of throat.

When a woman suffers "pain of the womb" after childbirth, about 5 to 10 g of plant material are swallowed in the morning and again in the evening until the symptoms disappear. In addition, the plant material is sometimes mixed with *Otostegia persica* (*gürdër*, see p. 65) as a quick relief for postparturition pain.

SOURCE—Hills near Buleda.

PRICE—40 rupees/kg.

PLANTAGINACEAE

Plantago amplexicaulis Cav. (Icon.: Kazmi, Fl. W. Pak. 62: 10, fig. 11–J, 1974).

VOUCHER SPECIMEN—AG & SMG 4803.

LOCALITY—Pasni bazaar.

VERNACULAR NAME—*dānīchāk*.

USE—To relieve dysentery; particularly effective in acute cases with discharge of blood and pus in the feces.

TREATMENT—About 8 to 10 g of seed are soaked in a cup of goat's or cow's milk for two to three hours or until they swell. The seeds and milk are then consumed. This dosage is usually taken twice per day for two or three days.

SOURCE—Common local plant, generally found only after rain.

PRICE—32 rupees/kg.

COMMENTS—The Baluchistan District Gazetteer Series (1907, vol. VI, p. 221) mentions that in the Sarawan area, "*isabghol* (*Plantago ovata*) is swallowed with *bhang* (*Cannabis sativa*)" to treat dysentery and diarrhea. Further, in the Kachhi area, *P. ovata* is used to treat cholera; a "draught" of it mixed with poppy seeds and basil is drunk, the juice of onions "is freely given," and the patient's clothes are soaked in water (Baluchistan District Gazetteer Series, 1907, vol. VI-A, p. 184). Turchetta (1989) noted that in the Quetta bazaar the seeds of this plant are sold to treat diarrhea and intestinal infections.

RUBIACEAE

Jaubertia aucheri Guill. (Icon.: Nazimuddin & Qaiser, Fl. Pak. 190: 98, fig. 24D–H, 1989).

syn.: *Gaillonia aucheri* (Guill.) Jaub & Spach.

VOUCHER SPECIMEN—AG & SMG 4541.

LOCALITY—Turbat bazaar.

VERNACULAR NAME—*tūssū*.

USES—Given to young children when they are having difficulty digesting milk or suffering from associated stomach pain. Also acts as a sedative.

TREATMENT—Between 5 and 10 g of seed are boiled in two cups of water for a short period of time. The child is coaxed to drink as much of the decoction as possible before being put to bed for the night.

SOURCE—Hills surrounding Turbat.

PRICE—40 rupees/kg.

CUCURBITACEAE

Citrullus colocynthis (L.) Schrad. (Icon.: Nazimuddin & Naqvi, Fl. Pak. 154: 12, fig. 3I–M, 1984).

syn.: *Cucumis colocynthis* L.

VOUCHER SPECIMEN—Not collected.

LOCALITY—Kalat bazaar.

VERNACULAR NAME—*gūch* (Br).

USE—To relieve stomach pain and gas in domestic animals.

TREATMENT—Between three and six seeds are force-fed to the animal. One dose is usually considered sufficient to relieve the problem.

SOURCE—Common in lowland areas.

PRICE—12 rupees/kg.

COMPOSITAE

Achillea millefolium L. (Icon.: Huber-Morath, Fl. Iran. 158: 62, tabs. 62, 64, 1986).

VOUCHER SPECIMEN—AG & SMG 5014.

LOCALITY—Khuzdar bazaar.

VERNACULAR NAME—*brīnjāsk*.

USES—To treat jaundice (*kāwāl*) and also for dehydration in young children as a result of diarrhea.

TREATMENTS—For jaundice, 10 g of mixed flowers and fruits are soaked in one cup of water for about two hours. The infusion is then strained and drunk. Generally three doses are taken each day for at least one week or until the symptoms pass.

For cases of dehydration in babies up to six months old, 5 g of herb are soaked in four or five tablespoons of water for at least two hours; the

infusion is then strained and divided into three equal parts. The standard procedure is for one part to be taken in the early morning, the second at midday, and the third in late evening. This procedure is repeated for two days. For older babies the same dosage is given, but the treatment period can be extended up to one week.

SOURCE—Panjgur area.

PRICE—30 rupees/kg.

Achillea wilhelmsii C. Koch (Icon.: Huber-Morath, Fl. Iran. 158: 53, tab. 54, 1986).

syn.: *Achillea santolina* auct. non L.: *sensu* Burkhill et aucts.

VOUCHER SPECIMEN—AG & SMG 4551.

LOCALITY—Turbat bazaar.

VERNACULAR NAME—*bōī mādrān*.

USES—To relieve “pain or dryness of the navel” and stomach pain or gas.

TREATMENT—About 25 to 30 g of mixed flowers and stems are soaked in one glass of water overnight. In the morning the infusion is strained and drunk. A less widely used method is to directly consume a small quantity of ground herb.

SOURCE—Areas around Surab, Kalat, and Khuzdar.

PRICE—40 rupees/kg.

COMMENTS—The flowers of this plant are sold in the Quetta bazaar as a treatment for diabetes and intestinal gas (Turchetta, 1989).

VOUCHER SPECIMEN—AG & SMG 4889.

LOCALITY—Bella bazaar.

VERNACULAR NAME—*bōī mādrān*.

USE—To relieve symptoms associated with the common cold.

TREATMENT—Ten grams of mixed flowers and stems are boiled in one cup of water, and when $\frac{1}{2}$ of the liquid remains, the decoction is strained, slightly salted, and drunk. Generally this dosage is taken once in the morning and again in the evening for four to five days or until symptoms disappear.

SOURCE—Khuzdar and Kharan mountains.

PRICE—20 rupees/kg.

VOUCHER SPECIMEN—AG & SMG 5016.

LOCALITY—Khuzdar bazaar.

VERNACULAR NAME—*bōī mādrān*.

USE—To treat dehydration associated with summer heat. A thirst quencher.

TREATMENT—Between 10 and 15 g of mixed flowers and stems are soaked overnight in one glass of water. The following morning the infusion is strained and divided into three equal parts. These doses are taken orally in the morning before breakfast, around midday, and at night before bed. This treatment is continued for three or four days. Some people use it as a general “preventative tonic” during the hot season.

SOURCE—In cultivated fields near Kalat and Khuzdar.

PRICE—8 rupees/kg.

Artemisia cf. absinthium L. (Icon.: Rechinger, Fl. Iran. 158: 182, tab. 167, 1986).

VOUCHER SPECIMEN—AG & SMG 4766.

LOCALITY—Gwadar bazaar.

VERNACULAR NAME—*sūr īsfānthān*.

USE—To relieve joint pain.

TREATMENT—Ten grams of seed are taken orally with water, generally in the morning and evening. In some cases, particularly for pain at the base of the jaw, finely ground seeds are mixed with water and the resulting poultice is applied directly to the affected area.

SOURCE—Areas of Makran.

PRICE—40 rupees/kg.

COMMENTS—*A. absinthium* is not native to the area.

VOUCHER SPECIMEN—AG & SMG 4811.

LOCALITY—Pasni bazaar.

VERNACULAR NAME—*dānāk*.

USES—To dry up pimples associated with measles (*bād*), as a purgative, and to relieve cases of the shakes (*lūqūā*).

TREATMENTS—For measles, about 20 g of seed are ground with a small quantity of *mūr* (an unidentified plant resin imported from Sindh, see p. 73) and the mixture is swallowed two or three times per day until the pimples dry up.

As an anticonstipatory, 5 g of herb are ground to a fine powder and taken orally. In slight cases one dose is generally sufficient; in acute cases this same quantity should be taken once or twice per day for seven to 10 days. For the “shakes,” 10 g of pulverized seeds are taken orally two times per day for about one month.

SOURCE—Not recorded.

PRICE—20 rupees/kg.

Artemisia olivieriana J. Gay ex. Bess. (Icon.: Podlech, Fl. Iran. 158: 207, tab. 198, 1986).

VOUCHER SPECIMEN—AG & SMG 4539.

LOCALITY—Turbat bazaar.

VERNACULAR NAMES—*dērnā*, *jīr* (Br).

USE—To relieve stomach pain and gas.

TREATMENT—Ten grams total of powdered fruits, stems, and leaves are eaten in the early morning and again in the evening before bed. Treatment continues until symptoms disappear.

SOURCE—Hills near Buleda.

PRICE—40 rupees/kg.

VOUCHER SPECIMEN—AG & SMG 4812.

LOCALITY—Pasni bazaar.

VERNACULAR NAMES—*dārd dānā*, *dārd dūn*.

USES—To relieve indigestion and stomach pain, as a thirst quencher, and as a vermifuge.

TREATMENT—For all of these ailments, the same treatment is used. About 50 g of seed are soaked in one glass of water overnight. In the morning the infusion is strained and divided into three doses: one is drunk before breakfast, the second in the midafternoon, and the third at night before bed. The treatment is generally continued until the symptoms have disappeared. As a vermifuge it is effective against round- and flatworms.

SOURCE—Found throughout Balochistan.

PRICE—5 rupees/kg when in season and 40 rupees/kg when out of season.

VOUCHER SPECIMEN—Not collected.

LOCALITY—Khuzdar bazaar.

VERNACULAR NAME—*jīr*.

USES—To relieve fever, skin rash, and stomach pain in children.

TREATMENTS—For all types of fever, between 50 and 100 g of aerial portions (dried or fresh) are boiled in 1½ L of water. When ½ of the liquid is left, the decoction is strained and stored. The normal dose is ¾ cup of the medicine taken twice per day, in the morning and again in the evening after meals, for three days.

For skin rash, ½ kg of the herb is soaked overnight in a bucket containing about 4 L of water. In the morning the infusion is strained and used as bathwater. This treatment is repeated each day for three days. Any pimples associated with the rash quickly erupt and then dry up. Our informant

described this disorder as reddish pimples on the skin, either with or without pus, which are caused by fever or excessive heat.

To treat stomach pain in children up to seven years old, a quantity of the herb is ground into powder, and then mixed with a small amount of water and mustard oil to form a thick paste. This poultice is applied directly to the skin of the stomach area and left for 12 hours. One application is generally sufficient to relieve the symptoms.

SOURCE—Mountains near Kalat.

PRICE—Not recorded.

Hertia intermedia (Boiss.) O. Ktze. (Icon.: Dittrich et al., Fl. Iran. 164: 97, tab. 65, 1989).

syn.: *Othonopsis intermedia* Boiss.

VOUCHER SPECIMEN—AG & SMG 4537.

LOCALITY—Turbat bazaar.

VERNACULAR NAME—*māngōlī*.

USE—To relieve pain associated with stomachache.

TREATMENT—In both the morning and the evening, about 10 to 15 g of powdered leaves and stems are taken orally with water. This treatment is continued until symptoms disappear, generally within a day or two.

SOURCE—Buleda and Zamuran Hills.

PRICE—40 rupees/kg.

VOUCHER SPECIMEN—AG & SMG 5004.

LOCALITY—Khuzdar bazaar.

VERNACULAR NAMES—*māngōlī*, *mūngli*.

USE—As an emmenagogue, particularly in cases when the menstrual cycle has stopped.

TREATMENT—Twenty grams of leaves are boiled in one cup of water, and when ¾ of the liquid remains, the decoction is strained and drunk. Generally the treatment is taken twice per day for two days. If menstruation does not commence, the frequency is increased to thrice per day for another two days.

SOURCE—Common plant in Khuzdar area.

PRICE—15 rupees/kg.

COMMENTS—Our informant, a male, mentioned that menstruation might cease if a woman was enemic or excessively exerting herself (e.g., picking up heavy loads or working hard in agricultural fields).

Launaea tomentella Rech. f. (Icon.: Rechinger et al., Fl. Iran. 122: 150, tab. 107, 1986).

VOUCHER SPECIMEN—AG & SMG 4546.

LOCALITY—Turbat bazaar.

VERNACULAR NAME—*chālōr*.

USES—To relieve stomach problems and indigestion in goats; also acts to stimulate appetite and urination. Never used for humans.

TREATMENTS—Between 30 and 40 g of stems are soaked in water for 24 hours, removed, and fed to the goat. A single treatment is generally considered sufficient to relieve these ailments.

SOURCE—Collected near the Iranian border, in areas near Mand, Buleda, and in the Zamuran Hills.

PRICE—24 rupees/kg.

Microcephala lamellata (Bunge) Pobed (Icon.: Podlech, Fl. Iran. 158: 83, tab. 81, 1986).

syn.: *Matricaria lamellata* Bunge.

VOUCHER SPECIMEN—AG & SMG 5000.

LOCALITY—Khuzdar bazaar.

VERNACULAR NAMES—*pīmplī*, *bābōōnāh* (U).

USES—To treat jaundice (*kāwāl*) and to relieve stomach pain.

TREATMENT—For jaundice, 10 g of flowers are soaked in one cup of water for an hour; the infusion is then strained and drunk. The standard procedure is for three such doses to be administered each day for seven days, after which time the jaundice is generally cured. (See pp. 10–11 for a discussion of the relationship between jaundice and malaria.)

For stomach pain, 5 g of flowers are ground into powder and swallowed with water. Generally this dosage is given once in the morning and again in the evening. One day of treatment is usually sufficient to relieve the pain.

SOURCE—Grows near Quetta, Kalat, and Mastung.

PRICE—20 rupees/kg.

Pluchea arguta Boiss. (Icon.: Georgiadou et al., Fl. Iran. 145: 8, tab. 4, 1980).

VOUCHER SPECIMEN—AG & SMG 4527.

LOCALITY—Turbat bazaar.

VERNACULAR NAME—*mājūsār*.

USE—To relieve stomach pain.

TREATMENT—About 25 to 35 g of mixed fruits, leaves, and stems are soaked in one glass of water overnight, and in the early morning the infusion is strained and drunk. One application is generally sufficient.

SOURCE—Hills near Buleda and Turbat.

PRICE—40 rupees/kg.

Presumed Minerals

VOUCHER SPECIMEN—AG & SMG 4891.

LOCALITY—Bella bazaar.

VERNACULAR NAME—*kōhī mōmlāī*.

USE—For relief of joint and muscular pain associated with internal injury, particularly trauma, after an accident.

TREATMENT—About 1 kg of this natural pitch is boiled in 2 L of water, along with 10 g of cardamom and 100 g of *ghee* (clarified butter). The mixture is cooked down until it reaches a semi-solid state and then is allowed to cool. It can then be stored for extended periods of time. Two small balls about the size of a green pea are rolled out, coated with *ghee*, and swallowed. This treatment is taken in the morning and again in the evening until the pain disappears.

SOURCE—Mountains near Wad.

PRICE—Not recorded.

COMMENTS—Aitchison (1890, pp. 134, 136, 159) considered *mōmlāī* a natural pitch collected in the Kohistan Range of northern Pakistan. One of our informants from Bella mentioned that the best *kōhī mōmlāī* came from the hills near Wad, but this source has been more or less exhausted and an inferior grade is now collected and mixed with filler. He further noted that when wild or domestic sheep or goats frequent a mountainous area, their urine and feces build up between rocks and harden over time, and the mass slowly seeps out in the form of *kōhī mōmlāī*. He was a strong believer in the therapeutic value of this compound, and offered, “if for some reason it fails [to cure ailments], this was simply due to the inferior grade sold in the market.” Hooper (1937, pp. 198–199) reported that a form of “*mummiāi*” found in an Iranian market was composed largely of urea, which supported information he obtained from a local medical dictionary that this compound “is the inspissated urine of the mountain goat.” There appear to be several forms and different sources of *mōmlāī*. Mahdihassan and Erdman (1988) performed an elementary analysis of a sample of *sīlājīt* [= *sālājīt*] (Urdu for *kōhī mōmlāī*, *mōmāī* [Said, 1970])

collected in the Chitral area and found it to be composed of 43.9% water-soluble carbon, 23.2% water-insoluble carbon, and 37.1% oxygen.

VOUCHER SPECIMEN—AG & SMG 4769.

LOCALITY—Gwadar bazaar.

VERNACULAR NAMES—*kōhī mōmlāī*, *sālājūt* (U).

USE—To relieve backache.

TREATMENT—A thumbnail-size piece of the pitch (about 5 g) is boiled in one cup of milk, and when $\frac{1}{2}$ of the liquid remains, the mixture is cooled and drunk. This medicine is taken for three or four days, always at night before bed. Our informant mentioned that *kōhī mōmlāī* is not a plant or plant by-product but rather, as the Balochi name means, “the juice of the mountain.”

SOURCE—Quetta Mountains.

PRICE—Two qualities, the lower grade at 60 rupees/kg and the superior grade at 200–250 rupees/kg.

COMMENTS—An informant in the Pasni bazaar described the same use and treatment for this medicine as our contact in Gwadar. He also noted that it increases sexual prowess: “If the back is strong, the sex is strong.”

Unknowns

VOUCHER SPECIMEN—AG & SMG 4804.

LOCALITY—Pasni bazaar.

VERNACULAR NAME—*rēhāl*.

USE—To treat first- and second-degree burns.

TREATMENT—A small quantity of powdered gum is mixed with *ghee* or oil. This ointment is rubbed on areas of the skin with first-degree burns. Generally four to six applications are sufficient. In cases of second-degree burns, powdered resin is applied directly to the wound.

SOURCE—An unidentified tree that grows in Balochistan.

PRICE—20 rupees/kg.

VOUCHER SPECIMEN—AG & SMG 4809.

LOCALITY—Pasni bazaar.

VERNACULAR NAME—*mūr*.

USE—Ingredient in a compound medicine used to treat measles.

TREATMENT—See under *dānāk* (*Artemisia* sp., p. 70) for information on the use of this resin.

SOURCE—Imported from Sindh.

PRICE—Not recorded.

VOUCHER SPECIMEN—AG & SMG 4813.

LOCALITY—Pasni bazaar.

VERNACULAR NAME—*shān kī sūr*.

USES—To treat internal injury, and for hairline bone fractures.

TREATMENTS—For both of these uses, 10 g of mixed fruits, stems, and leaves are boiled in four cups of water. When $\frac{1}{2}$ of the liquid remains, the decoction is strained, cooled, and drunk. The standard practice is for one such dose to be administered each day for three to four days. In cases of mild injury, one or two days of treatment is sufficient; in acute cases treatment is continued for seven to ten days. An alternative preparation entails boiling down the decoction until it becomes a thick paste. This is then rolled out into small pea-size balls, which are taken with the same frequency as the decoction.

SOURCE—Not recorded.

PRICE—80 rupees/kg.

VOUCHER SPECIMEN—AG & SMG 5012.

LOCALITY—Khuzdar bazaar.

VERNACULAR NAME—*mōr pōzzo* (B, U, F).

USE—Given to children up to one year old to help restore lost body fluids caused by severe cases of diarrhea.

TREATMENT—Fruits and stems of this plant are used in equal proportions with *brinjāsk* (*Achillea millefolium*, see p. 69). Ten grams of the mixture are soaked for $\frac{1}{2}$ hour in one cup of water, then strained and divided into three equal parts. These doses are taken orally in the morning, afternoon, and evening. In slight cases the treatment is given for only one day, in extreme cases for two days.

SOURCE—Hills near Panjgur and toward the Iranian border.

PRICE—30 rupees/kg.

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APPENDIX 1. Gazetteer of localities mentioned in the text.

Locality	Lat. (N)	Long. (E)
Awaran	26°27'	65°14'
Bella (Bela)	26°14'	66°19'
Besima	27°54'	65°49'
Bolan	29°53'	67°14'
Buleda	~26°15'	~63°00'
Dasht	~26°00'	~62°45'
Garr Hills	~28°30'	~66°10'
Gwadar	25°07'	62°19'
Hala Range	~26°00'	~66°09'
Harboi Hills	~28°40'	~66°40'
Hindubagh	30°49'	67°45'
Hoshab	26°01'	63°56'
Jhalawan	see Figure 2	
Jhal Jao	26°18'	65°35'
Johan	29°20'	66°58'
Kachhi	see Figure 3	
Kalat	29°02'	66°35'
Kech	~26°05'	~63°30'
Kharan	28°35'	65°25'
Khuzdar	27°48'	66°37'
Kirthar Range	~27°00'	~67°10'
Kohistan Range	~35°00'	~72°50'
Kunj	27°46'	66°29'
Labach	26°28'	65°13'
Loralai	30°22'	68°36'
Mand	26°07'	62°03'
Mashkai	27°07'	65°34'
Mastung	29°48'	66°51'
Mor Range	~26°10'	~66°45'
Nal	27°40'	66°12'
Nichara	28°52'	66°45'
Nihing	~26°00'	~62°44'
Nushki	29°33'	66°01'
Ormara	25°12'	64°38'
Pab Range	~26°30'	~66°45'
Panjgur	26°58'	64°06'
Pasni	25°16'	63°28'
Pishin	30°35'	67°00'
Quetta	30°12'	67°00'
Sarawan	see Figure 2	
Shahrig	30°11'	67°42'
Sonmiani	25°26'	66°36'
Surab	28°29'	66°16'
Turbat	25°59'	63°04'
Upper Zhob	~30°50'	~67°50'
Wad	27°21'	66°22'
Zamuran Hills	~26°30'	~62°40'
Zeedi	27°43'	66°53'

APPENDIX 2. Index of local plant names.

Local Name	Latin name	Family
aāth kā pāttā	<i>Olea ferruginea</i>	Oleaceae
āk	<i>Calotropis procera</i>	Asclepiadaceae
ālākū	<i>Launaea capitata</i>	Compositae
ālākū	<i>Launaea nudicaulis</i>	Compositae
āloony	<i>Zygophyllum eurypterum</i>	Zygophyllaceae
āpitāk	<i>Caralluma edulis</i>	Asclepiadaceae
	<i>Caralluma tuberculata</i>	Asclepiadaceae
āpūrs	<i>Juniperus excelsa</i>	Cupressaceae
āpūrsk	<i>Juniperus excelsa</i>	Cupressaceae
āpūtāk	<i>Caralluma tuberculata</i>	Asclepiadaceae
ārrigh	<i>Calotropis procera</i>	Asclepiadaceae
bābār	<i>Acacia nilotica</i>	Mimosaceae
bābār kā chāmra	<i>Acacia nilotica</i>	Mimosaceae
bābār kā chōdā	<i>Acacia nilotica</i>	Mimosaceae
bābōōnāh	<i>Microcephala lamellata</i>	Compositae
bāboor	<i>Parkinsonia aculeata</i>	Caesalpiniaceae
bābūnā	<i>Microcephala lamellata</i>	Compositae
bāngērō	<i>Gentiana olivierii</i>	Gentianaceae
bārā gwāthāg	<i>Zosima absinthifolia</i>	Umbelliferae
bārā gwāthāk	<i>Zosima absinthifolia</i>	Umbelliferae
bār chībkī	<i>Solanum surattense</i>	Solanaceae
bār	<i>Abutilon muticum</i>	Malvaceae
bātāg	<i>Solanum incanum</i>	Solanaceae
bāthūā	<i>Chenopodium murale</i>	Chenopodiaceae
bēr	<i>Zizyphus nummularia</i>	Rhamnaceae
bhāng	<i>Cannabis sativa</i>	Cannabaceae
bhāēr	<i>Solanum incanum</i>	Solanaceae
bhārēr	<i>Solanum surattense</i>	Solanaceae
bōi mādrān	<i>Achillea wilhelmsii</i>	Compositae
boteri	<i>Caralluma tuberculata</i>	Asclepiadaceae
brinjāsk	<i>Achillea millefolium</i>	Compositae
būzi īzbūthāk	<i>Psammogeton biternatus</i>	Umbelliferae
cātārch	<i>Grewia erythraea</i>	Tiliaceae
chāgīrd	<i>Acacia jacquemontii</i>	Mimosaceae
chālōr	<i>Launaea tomentella</i>	Compositae
chārmāng	<i>Onosma limitaneum</i>	Boraginaceae
chārmēng	<i>Trichodesma africanum</i>	Boraginaceae
chibriāl vāl	<i>Solanum surattense</i>	Solanaceae
chōtā gwāthāk	<i>Anethum graveolans</i>	Umbelliferae
dāghām	<i>Scorzonera tunicata</i>	Compositae
dāgūrā	<i>Cordia macleodii</i>	Boraginaceae
dānāk	<i>Artemisia cf. absinthium</i>	Compositae
dāndānōi	<i>Cordia gharaf</i>	Boraginaceae
dānichāk	<i>Plantago amplexicaulis</i>	Plantaginaceae
dānnān shān	<i>Eremostachys loasifolia</i>	Labiatae
dārd dānā	<i>Artemisia olivieriana</i>	Compositae
dārd dūn	<i>Artemisia olivieriana</i>	Compositae
dēdār	<i>Euphorbia caducifolia</i>	Euphorbiaceae
dērnā	<i>Artemisia olivieriana</i>	Compositae
dhātūrā	<i>Datura innoxia</i>	Solanaceae
dōlkō	<i>Convolvulus spinosus</i>	Convolvulaceae
drāgūr	<i>Cordia macleodii</i>	Boraginaceae
drūhūnd	<i>Schweinfurthia papilionacea</i>	Scrophulariaceae
gāt	<i>Salix acmophylla</i>	Salicaceae
gāndākū	<i>Peganum harmala</i>	Zygophyllaceae
gāndrēm	<i>Haplophyllum tuberculatum</i>	Rutaceae
gāngī	<i>Grewia erythraea</i>	Tiliaceae
gārbūst	<i>Cardaria draba</i>	Cruciferae
gāz	<i>Tamarix aphylla</i>	Tamaricaceae
	<i>Tamarix dioica</i>	Tamaricaceae
	<i>Tamarix indica</i>	Tamaricaceae
	<i>Tamarix stricta</i>	Tamaricaceae

Local Name	Latin name	Family
<i>gāz khōr</i>	<i>Tamarix aphylla</i>	Tamaricaceae
<i>gēytēchāk</i>	<i>Dodonaea viscosa</i>	Sapindaceae
<i>ghāwārgh</i>	<i>Tulipa lehmanniana</i>	Liliaceae
<i>ghūr gān</i>	<i>Tribulus terrestris</i>	Zygophyllaceae
<i>gīshār</i>	<i>Periploca aphylla</i>	Asclepiadaceae
<i>gōrāgō</i>	<i>Chenopodium murale</i>	Chenopodiaceae
<i>gūch</i>	<i>Citrullus colocynthis</i>	Cucurbitaceae
<i>gūgār</i>	<i>Commiphora wightii</i>	Burseraceae
<i>gul gidar</i>	<i>Otostegia persica</i>	Labiatae
<i>gūl kākār bāngērō</i>	<i>Salvia busharica</i>	Labiatae
<i>gūl sūrh</i>	<i>Polygonum plebejum</i>	Polygonaceae
<i>gūldēr</i>	<i>Otostegia persica</i>	Labiatae
<i>gūn goonjāk</i>	<i>Pistacia khinjuk</i>	Anacardiaceae
<i>gūrdēr</i>	<i>Otostegia persica</i>	Labiatae
<i>gūrgāndākō</i>	<i>Tribulus longipetalus</i>	Zygophyllaceae
<i>gwān</i>	<i>Pistacia khinjuk</i>	Anacardiaceae
<i>gwānāk</i>	<i>Vitex negundo</i>	Verbenaceae
<i>gwān gūr</i>	<i>Pistacia khinjuk</i>	Anacardiaceae
<i>gwānik</i>	<i>Vitex agnus-castus</i>	Verbenaceae
<i>gwāthāk</i>	<i>Zosima absinthifolia</i>	Umbelliferae
<i>gwōnj</i>	<i>Citrullus colocynthis</i>	Cucurbitaceae
<i>handel</i>	<i>Citrullus colocynthis</i>	Cucurbitaceae
<i>hārīngri</i>	<i>Citrullus colocynthis</i>	Cucurbitaceae
<i>hārmāl</i>	<i>Peganum harmala</i>	Zygophyllaceae
<i>hāt chīptī</i>	<i>Solanum surattense</i>	Solanaceae
<i>hāvāi</i>	<i>Cymbopogon jawarancusa</i>	Gramineae
<i>hēnnā</i>	<i>Lawsonia inermis</i>	Lythraceae
<i>hīng</i>	<i>Ferula assa-foetida</i>	Umbelliferae
<i>hīng pātrāk</i>	<i>Ferula assa-foetida</i>	Umbelliferae
<i>hūssāin booti</i>	<i>Teucrium stocksianum</i>	Labiatae
<i>isabghol</i>	<i>Plantago ovata</i>	Plantaginaceae
<i>īshrēk</i>	<i>Rhazya stricta</i>	Apocynaceae
<i>īshrēk phālī</i>	<i>Rhazya stricta</i>	Apocynaceae
<i>īzboothāk</i>	<i>Trachyspermum ammi</i>	Umbelliferae
<i>īzgānd</i>	<i>Zataria multiflora</i>	Labiatae
<i>īzghānd</i>	<i>Zataria multiflora</i>	Labiatae
<i>īzgīnd</i>	<i>Zataria multiflora</i>	Labiatae
<i>jāmbō</i>	<i>Brassica juncea</i>	Cruciferae
<i>jānglī pōdīnā</i>	<i>Mentha longifolia</i>	Labiatae
<i>jār</i>	<i>Salvadora oleioides</i>	Salvadoraceae
<i>jāwāsoo</i>	<i>Fagonia indica</i>	Zygophyllaceae
<i>jhāmbō</i>	<i>Microsymbrium flaccidum</i>	Cruciferae
<i>jir</i>	<i>Artemisia olivieriana</i>	Compositae
<i>jīwāsā</i>	<i>Alhagi maurorum</i>	Papilionaceae
<i>jōr</i>	<i>Nerium oleander</i>	Apocynaceae
<i>jōsāg</i>	<i>Chenopodium album</i>	Chenopodiaceae
<i>kāhū jā pānn</i>	<i>Olea ferruginea</i>	Oleaceae
<i>kākīnk</i>	<i>Withania somnifera</i>	Solanaceae
<i>kāl</i>	<i>Suaeda fruticosa</i>	Chenopodiaceae
<i>kālēdō</i>	<i>Capparis decidua</i>	Capparidaceae
<i>kālēdōk</i>	<i>Capparis decidua</i>	Capparidaceae
<i>kālēr</i>	<i>Capparis decidua</i>	Capparidaceae
<i>kālpūrā</i>	<i>Teucrium stocksianum</i>	Labiatae
<i>kāndēri</i>	<i>Solanum surattense</i>	Solanaceae
<i>kāndērō</i>	<i>Otostegia persica</i>	Labiatae
<i>kārāk</i>	<i>Calotropis procera</i>	Asclepiadaceae
<i>kārār</i>	<i>Capparis decidua</i>	Capparidaceae
<i>kārēk</i>	<i>Calotropis procera</i>	Asclepiadaceae
<i>kārēkā</i>	<i>Fagonia indica</i>	Zygophyllaceae
	<i>Fagonia olivieri</i>	Zygophyllaceae
<i>kārēkāwāg</i>	<i>Fagonia bruguieri</i>	Zygophyllaceae
	<i>Fagonia glutinosa</i>	Zygophyllaceae

APPENDIX 2. Continued.

Local Name	Latin name	Family
	<i>Fagonia indica</i>	Zygophyllaceae
	<i>Fagonia olivieri</i>	Zygophyllaceae
kāspīnd	<i>Cassia italica</i>	Caesalpinaceae
kāwīl	<i>Rhazya stricta</i>	Apocynaceae
khāar	<i>Zygophyllum propinquum</i>	Zygophyllaceae
khābbār	<i>Salvadora oleioides</i>	Salvadoraceae
khākhōbē	<i>Iris falcifolia</i>	Iridaceae
	<i>Crocus sp.</i>	Iridaceae
khākshēer	<i>Sisymbrium loeselii</i>	Cruciferae
khāskhāsh	<i>Papaver somniferum</i>	Papaveraceae
khāt	<i>Olea ferruginea</i>	Oleaceae
khāwāsdār	<i>Glycyrrhiza glabra</i>	Papilionaceae
khōt	<i>Olea ferruginea</i>	Oleaceae
khūrāmb	<i>Glossonema varians</i>	Asclepiadaceae
kīsānkār	<i>Peganum harmala</i>	Zygophyllaceae
kōhī bhāng	<i>Euphorbia talaina</i>	Euphorbiaceae
kōhī bood	<i>Commiphora wightii</i>	Burseraceae
kūl	<i>Typha domingensis</i>	Typhaceae
kulkusht	<i>Citrullus colocynthis</i>	Cucurbitaceae
kūlkūshā	<i>Citrullus colocynthis</i>	Cucurbitaceae
kūlmeer	<i>Pulicaria glaucescens</i>	Compositae
kūnār	<i>Zizyphus nummularia</i>	Rhamnaceae
lābbū	<i>Cistanche tubulosa</i>	Orobanchaceae
	<i>Orobanche stocksii</i>	Orobanchaceae
lānnī	<i>Suaeda fruticosa</i>	Chenopodiaceae
lāntū	<i>Taverniera sparteae</i>	Papilionaceae
līār	<i>Cordia gharaf</i>	Boraginaceae
māchēchūk	<i>Orobanche stocksii</i>	Orobanchaceae
magher	<i>Rumex vesicarius</i>	Polygonaceae
māirō	<i>Taverniera apollinea</i>	Papilionaceae
māirō māj	<i>Cassia italica</i>	Caesalpinaceae
mājūsār	<i>Pluchea arguta</i>	Compositae
mākōh	<i>Solanum nigrum</i>	Solanaceae
mādr	<i>Salvia aegyptiaca</i>	Labiatae
māngōlī	<i>Hertia intermedia</i>	Compositae
māngūlī	<i>Hertia intermedia</i>	Compositae
mārmoor	<i>Caralluma tuberculata</i>	Asclepiadaceae
mārmootāk	<i>Caralluma tuberculata</i>	Asclepiadaceae
mātētō	<i>Salvia cabulica</i>	Labiatae
mātē nōk	<i>Taverniera apollinea</i>	Papilionaceae
mōngūlī	<i>Hertia intermedia</i>	Compositae
mōr	<i>Salvia aegyptiaca</i>	Labiatae
mōrpād	<i>Ricinus communis</i>	Euphorbiaceae
mōrpāzoo	unidentified	Labiatae
mōrt	<i>Myrtus communis</i>	Myrtaceae
mūndērī	<i>Corchorus depressus</i>	Tiliaceae
mūngli	<i>Hertia intermedia</i>	Compositae
nādāg	<i>Cymbopogon jawarancusa</i>	Gramineae
nārō	<i>Inula grantioides</i>	Compositae
nārom	<i>Ephedra intermedia</i>	Ephedraceae
nēēm	<i>Azadirachta indica</i>	Meliaceae
nīmōlī	<i>Azadirachta indica</i>	Meliaceae
oedīchk	<i>Taverniera cuneifolia</i>	Papilionaceae
oodīchk	<i>Taverniera cuneifolia</i>	Papilionaceae
ooshī	<i>Dorema aureum</i>	Umbelliferae
pānīrbād	<i>Withania coagulans</i>	Solanaceae
pārābānd	<i>Withania coagulans</i>	Solanaceae
pārdūk	<i>Tecomella undulata</i>	Bignoniaceae
pārsānd	<i>Chrozophora oblongifolia</i>	Euphorbiaceae
pātāk	<i>Populus euphratica</i>	Salicaceae
pātrāk	<i>Ferula assa-foetida</i>	Umbelliferae
peelū	<i>Salvadora oleioides</i>	Salvadoraceae

APPENDIX 2. Continued.

Local Name	Latin name	Family
<i>pēesh</i>	<i>Nannorhops ritchiana</i>	Palmae
<i>pīmālākō</i>	<i>Allium umbilicatum</i>	Alliaceae
<i>pīmālūk</i>	<i>Asphodelus tenuifolius</i>	Liliaceae
<i>pimpli</i>	<i>Microcephala lamellata</i>	Compositae
<i>pīrpād</i>	<i>Roemeria hybrida</i>	Papaveraceae
<i>plām phool</i>	<i>Crocus sativus</i>	Iridaceae
<i>pōchikō</i>	<i>Malva neglecta</i>	Malvaceae
<i>pōdīnā</i>	<i>Mentha piperita</i>	Labiatae
<i>pūdānā</i>	<i>Mentha piperita</i>	Labiatae
<i>pūrchīnk</i>	<i>Lallemantia royleana</i>	Labiatae
	<i>Mentha longifolia</i>	Labiatae
<i>rāmbāvā</i>	<i>Pulicaria undulata</i>	Compositae
<i>rāmbō</i>	<i>Pulicaria undulata</i>	Compositae
<i>rāsbhārī</i>	<i>Withania somnifera</i>	Solanaceae
<i>rīghāt</i>	<i>Suaeda nudiflora</i>	Chenopodiaceae
<i>rīght</i>	<i>Suaeda nudiflora</i>	Chenopodiaceae
<i>rūtāchāk</i>	<i>Convolvulus spinosus</i>	Convolvulaceae
<i>roosh</i>	<i>Sisymbrium loeselii</i>	Cruciferae
<i>sātār</i>	<i>Zataria multiflora</i>	Labiatae
<i>sādāf</i>	<i>Haplophyllum tuberculatum</i>	Rutaceae
<i>sādāp</i>	<i>Haplophyllum tuberculatum</i>	Rutaceae
<i>sāgēndāntān</i>	<i>Blepharis ciliaris</i>	Acanthaceae
<i>sāhī</i>	<i>Rhazya stricta</i>	Apocynaceae
<i>sāpmōī</i>	<i>Caralluma tuberculata</i>	Asclepiadaceae
<i>sātāar</i>	<i>Zataria multiflora</i>	Labiatae
<i>sātāyr</i>	<i>Zataria multiflora</i>	Labiatae
<i>shāgūshāk</i>	<i>Glossonema varians</i>	Asclepiadaceae
<i>shāmāhūr</i>	<i>Launaea remotiflora</i>	Compositae
<i>shēz</i>	<i>Alhagi maurorum</i>	Papilionaceae
<i>shīmīmīl</i>	<i>Indigofera oblongifolia</i>	Papilionaceae
<i>shīmsh</i>	<i>Trigonella anguina</i>	Papilionaceae
	<i>Euphorbia granulata</i>	Euphorbiaceae
<i>shīmshōk</i>	<i>Mentha piperita</i>	Labiatae
<i>shīrāghō</i>	<i>Andrachne aspera</i>	Euphorbiaceae
<i>shīrīsh</i>	<i>Azadirachta indica</i>	Meliaceae
<i>shīz</i>	<i>Alhagi maurorum</i>	Papilionaceae
	<i>Fagonia indica</i>	Zygophyllaceae
<i>shōrduh</i>	<i>Zygophyllum propinquum</i>	Zygophyllaceae
<i>sīār</i>	<i>Rhazya stricta</i>	Apocynaceae
<i>sīmsōk</i>	<i>Mentha piperita</i>	Labiatae
<i>sīmsook</i>	<i>Mentha sp.</i>	Labiatae
<i>sōērīs</i>	<i>Polygonum argyrocoleon</i>	Polygonaceae
<i>sōnā</i>	<i>Cassia senna</i>	Caesalpinaceae
<i>sōrāg</i>	<i>Suaeda fruticosa</i>	Chenopodiaceae
<i>sōyā</i>	<i>Anethum graveolans</i>	Umbelliferae
<i>sūr īsfānthān</i>	<i>Artemisia cf. absinthium</i>	Compositae
<i>sūrkh jūr</i>	<i>Artemisia turanica</i>	Compositae
<i>tālkhā</i>	<i>Acroptilon repens</i>	Compositae
<i>thōār</i>	<i>Euphorbia caducifolia</i>	Euphorbiaceae
<i>thōr</i>	<i>Euphorbia caducifolia</i>	Euphorbiaceae
<i>thūssō</i>	<i>Salvia santolinifolia</i>	Labiatae
<i>tīm māh</i>	<i>Citrullus colocynthis</i>	Cucurbitaceae
<i>tōl āngūr</i>	<i>Solanum nigrum</i>	Solanaceae
<i>toot mēkh</i>	<i>Andrachne aspera</i>	Euphorbiaceae
<i>trūshpāk</i>	<i>Rumex vesicarius</i>	Polygonaceae
<i>trūshpākō</i>	<i>Rumex vesicarius</i>	Polygonaceae
<i>tūssū</i>	<i>Seddera latifolia</i>	Convolvulaceae
	<i>Jaubertia aucheri</i>	Rubiaceae
<i>zāmbūr</i>	<i>Cocculus hirsutus</i>	Menispermaceae

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